# 4.7 AIR QUALITY AND AIR TOXICS HEALTH RISKS

This section provides an evaluation of the air resource issues associated with the proposed Gregory Canyon Landfill. The organization of the discussion is as follows. First, a discussion of the existing conditions is presented, which consists of an overview of the regulatory framework, climate/meteorology, and air quality. Following this discussion is an explanation of the impact assessment methodology; a presentation of the potential air quality and health risk impacts of the proposed project; and recommended mitigation measures.

This section summarizes an Air Quality and Air Toxics Health Risks Technical Report prepared by PCR Services Corporation, June 2002 which is contained in the Appendix K to this Final EIR.

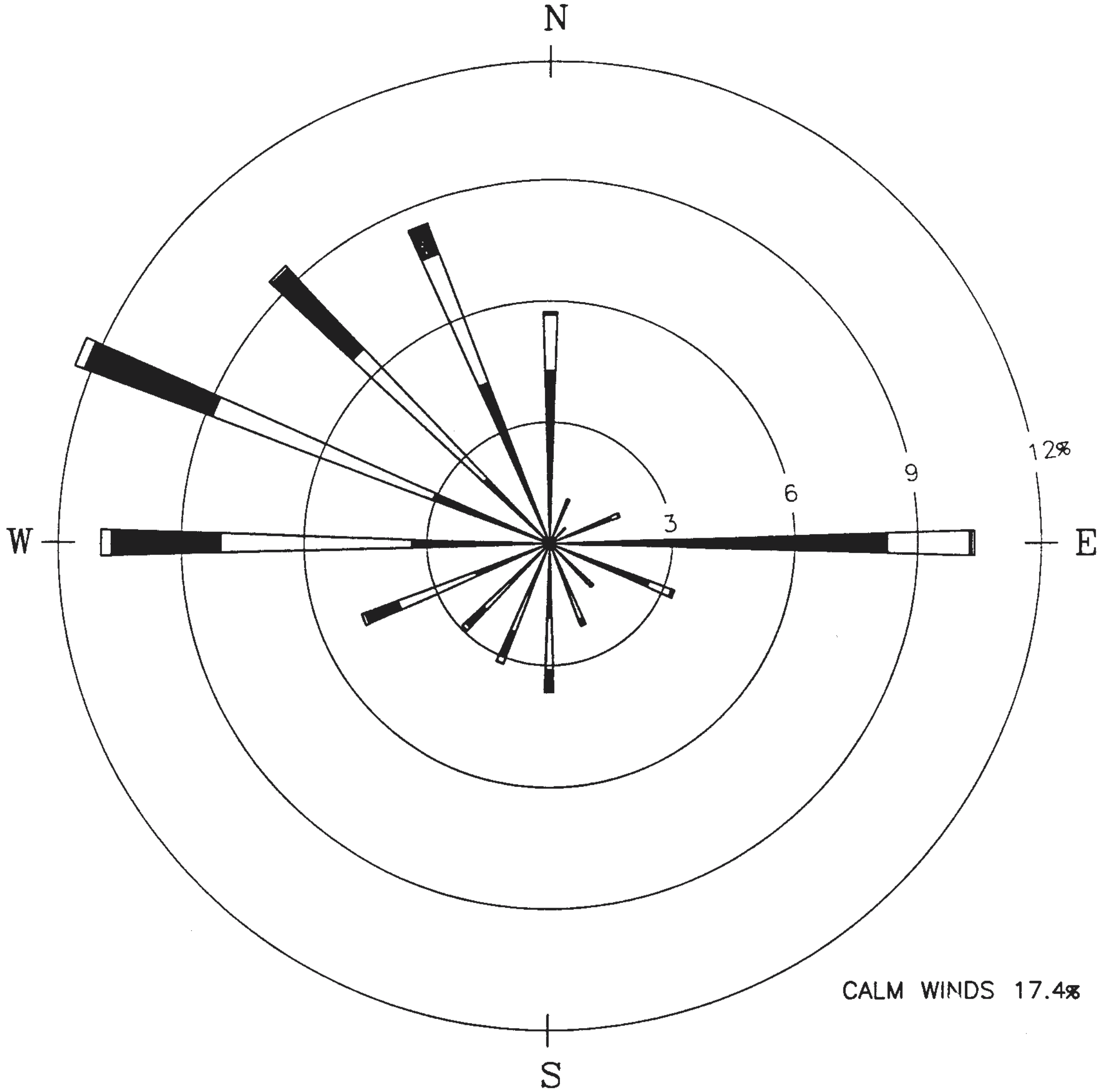
## 4.7.1 EXISTING SETTING

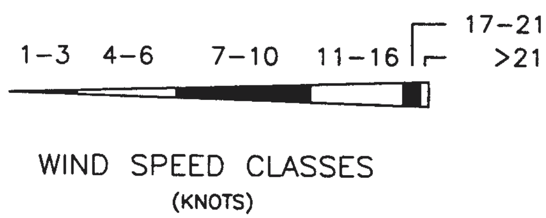
### 4.7.1.1 Meteorology/Climate

The climate of San Diego County is characterized by warm, dry summers and mild, wet winters and is dominated by a semi-permanent, high-pressure cell located over the Pacific Ocean. This high-pressure cell maintains clear skies for much of the year. It also drives the dominant onshore circulation and helps to create two types of temperature inversions, subsidence and radiation, that may occasionally contribute to local air quality degradation. Subsidence inversions occur during the warmer months, as descending air associated with the Pacific high-pressure cell comes into contact with cool marine air. The boundary between the two layers of air represents a temperature inversion that can trap pollutants below it. Radiation inversions typically develop on clear winter nights, when air near the ground cools by radiation, while the air aloft remains relatively warm. This phenomenon can result in a ground-level inversion that can trap pollutants within a shallow atmospheric layer.

Weather data, including surface and upper air measurements, are routinely recorded at Miramar Marine Corps Air Station, the meteorological station nearest the project site. Wind speed and direction data collected at Miramar in 1995 is typical for the air station and is presented in Exhibit 4.7-1 in the form of a wind rose. It shows the percent of time the wind comes from each direction. As shown, predominant winds at Miramar are from the northwest quadrant, with winds from the east and west also being common.

The topography of the Gregory Canyon site and surrounding areas influences the predominant wind pattern through shielding and redirection of the wind pattern, especially when the regional winds are light. Thus, airflow at Gregory Canyon results from a combination of regional wind patterns, subregional land/sea breezes, and local up-canyon/down-canyon flows. Wind data for the Gregory Canyon area were collected in September and October of 1989 by Higman Doehle Incorporated (see Exhibit 4.7-2). As shown, the predominant wind direction is from the northwest quadrant. Winds came from the northwest, north-northwest, or north a total of 42 percent of the time. A secondary wind direction is from the south, which occurred about 14 percent of the time. The local canyon topography frequently orients the regional west/east wind pattern into a northwest/south air flow. Winds from the eastern quadrant are rare. During the monitoring period, winds were calm (i.e., one mph or less) about six percent of the time. Winds above 12 mph were also rare, and occurred about 0.2 percent of the time. In summary,




# WINDROSE

STATION NO: 93107
MIRAMAR NAS, CA
PERIOD: 1995

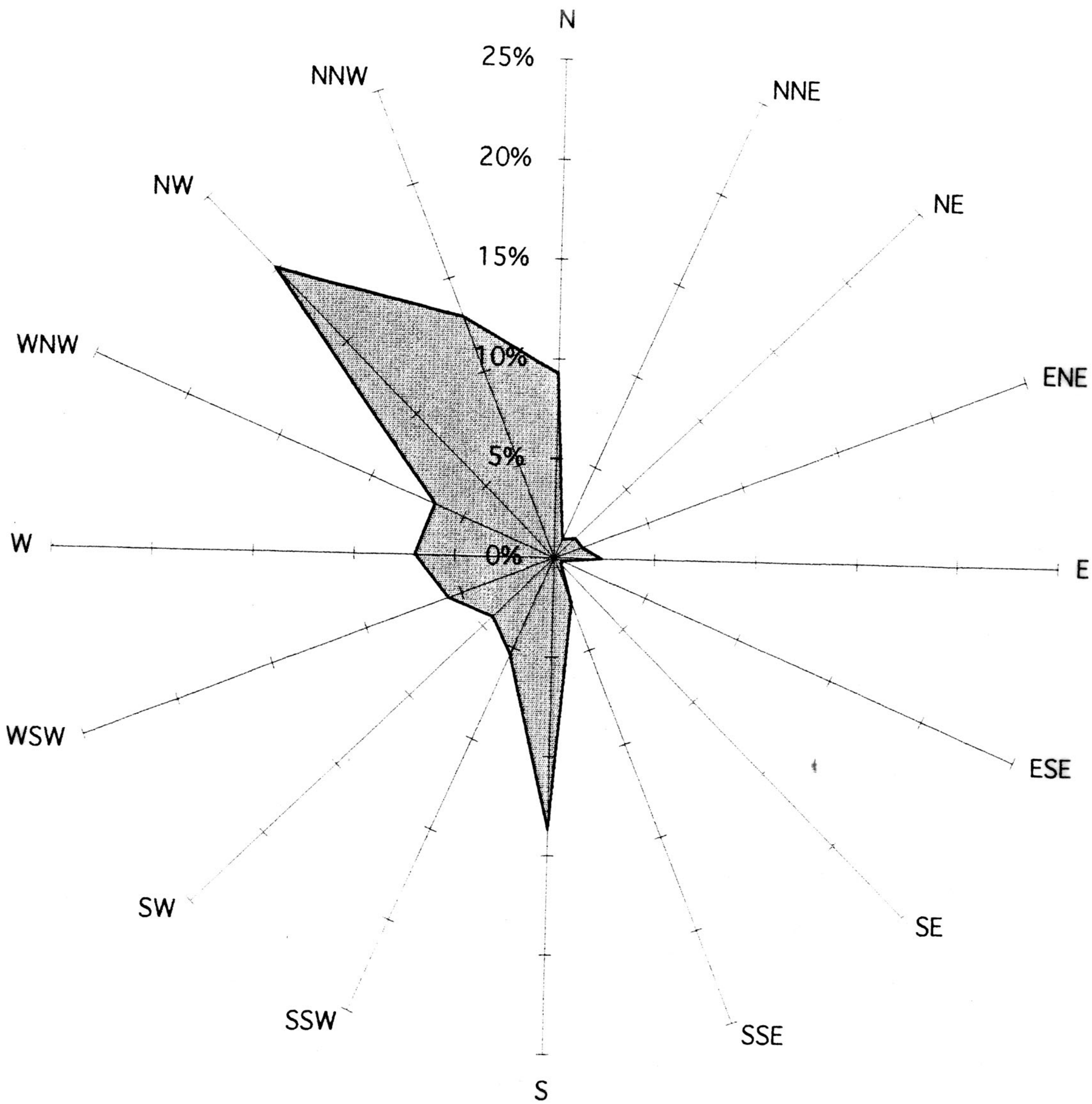
NOTES:
DIAGRAM OF THE FREQUENCY OF OCCURRENCE OF EACH WIND DIRECTION. WIND DIRECTION IS THE DIRECTION FROM WHICH THE WIND IS BLOWING. EXAMPLE – WIND IS BLOWING FROM THE NORTH 5.7 PERCENT OF THE TIME.

BEE–LINE
SOFTWARE

PCR

Exhibit 4.7-1
**Wind Rose for Miramar Naval Air Station**

Sources: Mestre Greve Associates, 1999; David Evans and Associates, 1999

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NOT TO SCALE

Exhibit 4.7-2
**Gregory Canyon**
**Wind Rose Analysis**

Sources: Mestre Greve Associates, 1999; David Evans and Associates, Inc., 1999 both stagnant periods and periods of high winds appear to be rare in this area during the months for which monitoring was performed. Although meteorological site-specific data is limited, Exhibits 4.7-1 and 4.7-2 substantiate the use of Miramar Marine Corps Station meteorological data for site specific conditions.

## Regulatory Framework

In response to longstanding concerns about air pollution, federal, State and local authorities have adopted various rules and regulations requiring evaluation of the impact of a project on air quality and appropriate mitigation for air pollutant emissions. This section focuses on current air quality planning efforts and the responsibilities of the agencies involved in these efforts. A discussion of ambient air quality standards is also provided.

### Federal Clean Air Act

The Federal Clean Air Act (CAA) was first enacted in 1955 and has been amended numerous times in subsequent years, including 1964, 1965, 1967, 1970, 1977, and most recently in 1990. The CAA establishes National Ambient Air Quality Standards (NAAQS) for the protection of human health and public welfare for six “criteria” pollutants: sulfur dioxide ($SO_2$), carbon monoxide (CO), ozone ($O_3$), nitrogen dioxide ($NO_2$), lead (Pb), and respirable particulate matter (particulate matter with a diameter less than or equal to 10 microns, or $PM_{10}$). The NAAQS represent the maximum levels of background pollution considered to protect the public health and welfare with an adequate margin of safety. The CAA also specifies future dates for achieving compliances with the standards. The NAAQS are shown, along with California State Ambient Air Quality Standards (CAAQS), in Table 4.7-1.

The 1990 amendments to the CAA identify specific emission reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or to meet interim milestones.

In July 1997 EPA published additional standards for both particulate matter and ozone. The revised ozone standard was to have phased out the one-hour standard with a new eight-hour standard established at the concentration of 0.08 parts per million (ppm). EPA sought to refine the particulate standard by including a new standard for fine particulate having an aerodynamic diameter of 2.5 microns or less. The revised particulate standard added a new annual $PM_{2.5}$ 24-hour standard of 65 $\Phi g/m^3$. In addition to the new $PM_{2.5}$ standards, EPA decided to retain the existing $PM_{10}$ standard of 150 $\Phi g/m^3$, but changed the form of the standard.

The CAA also mandates that each state submit and implement the State Implementation Plan (SIP) for local areas not meeting these standards. These plans must include pollution control measures that demonstrate how the standards will be met. A SIP is a compilation of goals, strategies, schedules and enforcement actions that will lead the state (including the San Diego Air Basin) into compliance with all federal air quality standards. Every change in a compliance schedule or plan must be incorporated into the SIP. The NAAQS were targeted to be achieved in each air basin by 1982; however, extensions to 1987 were granted to many air basins that incorporated available emission control tactics, but could not attain some standards by 1982.

**TABLE 4.7-1**
**AMBIENT AIR QUALITY STANDARDS**

| POLLUTANT | AVERAGING TIME | CALIFORNIA STANDARDS [a] | NATIONAL STANDARDS [a] | POLLUTANT HEALTH EFFECTS | MAJOR POLLUTANT SOURCES |
|---|---|---|---|---|---|
| Ozone ($O_3$) | 1 Hour | 0.09 ppm (180 µg/m$^3$) | 0.12 ppm (235 µg/m$^3$) | High concentrations can directly affect lungs, causing irritation. Common effects are damage to vegetation and cracking of untreated rubber. | Motor vehicles. |
| | 8 Hour | none | 0.08 (157 µg/m$^3$) | | |
| Carbon Monoxide (CO) | 1 Hour | 20 ppm (23 mg/m$^3$) | 35 ppm (40 mg/m$^3$) | Interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen. | Internal combustion engines, primarily gasoline-powered motor vehicles. |
| | 8 Hour | 9.0 ppm (10 mg/m$^3$) | 9 ppm (10 mg/m$^3$) | | |
| Nitrogen Dioxide ($NO_2$) | Annual Average | none | 0.053 ppm (100 µg/m$^3$) | Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. | Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, railroads. |
| | 1 Hour | 0.25 ppm (470 µg/m$^3$) | None | | |
| Sulfur Dioxide ($SO_2$) | Annual Average | none | 80 µg/m$^3$ (0.030 ppm) | Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants; destructive to marble, iron and steel. Limits visibility and reduces sunlight. | Fuel combustion, chemical plants, sulfur recovery plants and metal processing. |
| | 24 Hour | 0.04 ppm (105 µg/m$^3$) | 365 µg/m$^3$ (0.14 ppm) | | |
| | 1 Hour | 0.25 ppm (655 µg/m$^3$) | None | | |
| Particulate Matter ($PM_{10}$) | Annual Geometric Mean | 30 µg/m$^3$ | None | May irritate eyes and respiratory tract. Absorbs sunlight, reducing amount of solar energy reaching the earth. Produces haze and limits visibility. | Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities such as wind-raised dust and ocean spray. |
| | 24 Hour | 50 µg/m$^3$ | 150 µg/m$^3$ | | |
| | Annual Arithmetic Mean | None | 50 µg/m$^3$ | | |
| Fine Particulate Matter ($PM_{2.5}$) | Annual Arithmetic Average | None | 15 µg/m$^3$ | May increase respiratory symptoms and diseases and decrease lung function. | Vehicle exhaust, industrial combustion. |
| | 24 Hour | None | 65 µg/m$^3$ | | |
| Lead (Pb) | 30 days | 1.5 µg/m$^3$ | None | May cause brain and other nervous system damage and digestive problems. Some lead-containing chemicals cause cancer in animals. | Leaded gasoline, paint, smelters, and refineries. |
| | Calendar Quarter | None | 1.5 µg/m$^3$ | | |

[a] ppm = parts per million; Fg/m3 = micrograms per cubic meter; mg/m3 = milligrams per cubic meter.

*Source: California Air Resources Board, 1996, and the USEPA, 1997.*

Applicability of Additional Federal Requirements

The Clean Air Act Amendments of 1990 established new deadlines for achieving the NAAQS depending on the severity of nonattainment. The San Diego Air Basin is classified as "serious" for $O_3$ nonattainment as shown in Table 4.7-2. The ozone problem in the Basin is strongly affected by the transport of pollutants from the South Coast Air Basin and from Mexico. The District in collaboration with federal policy makers anticipates submitting a SIP revision retaining the "serious" classification and identifying the most expeditious, practical attainment date, considering the schedule for necessary reductions in transported pollution, as authorized by EPA policy.

**TABLE 4.7-2**
**SAN DIEGO AIR BASIN ATTAINMENT STATUS**

| Pollutant | National Standards | California Standards |
|---|---|---|
| Ozone ($O_3$) | Serious* | Non-attainment |
| Carbon Monoxide (CO) | Attainment | Attainment |
| Sulfur Dioxide ($SO_2$) | Attainment | Attainment |
| Nitrogen Dioxide ($NO_2$) | Attainment | Attainment |
| $PM_{10}$ | Not classified | Non-attainment |

* The Basin did not exceed the federal one-hour ozone standard in 1999 or 2000, and only twice in 2001. The Basin will remain officially designated as a serious non-attainment area for the federal one-hour $O_3$ standard until a formal request to redesignate to attainment is made by SDAPCD and CARB, and EPA finds all statutory criteria for redesignation have been met. However, the Basin will likely be in non-attainment for the new federal 8-hour $O_3$ standard upon official federal designation of attainment status.
*Source: PCR Services Corporation, June 2002.*

Applicability of Additional Federal Requirements

The landfill will be subject to two Federal New Source Performance Standards (NSPS):

- Subpart OOO (Standards of Performance for Nonmetallic Mineral Processing Plants); and
- Subpart WWW (Standards of Performance for Municipal Solid Waste Landfills).

Each of these NSPS establishes national standards for controlling emissions from parts of the facility, and each standard is fully applicable in San Diego to the Gregory Canyon Landfill.

Subpart OOO regulates particulate matter emissions from nonmetallic mineral plants processing such materials as sand, gravel, rock, stone, talc or boron for which construction, modification, or reconstruction commenced after August 31, 1983. The provisions specify opacity and particulate matter concentration standards and provide test methods, emission monitoring, reporting and record keeping requirements. Rock processing operations at the landfill would be subject to these requirements. The project as proposed would comply with these requirements, but would be subject to additional evaluation during the SDAPCD air permitting process.

Subpart WWW regulates air emissions from municipal solid waste (MSW) landfills. It applies to all currently open and closed landfills that commenced construction, reconstruction, or modification or began accepting waste on or after May 30, 1991. This regulation covers both new and existing landfills. Subpart WWW requires owners of affected landfills to submit to the EPA a report on a landfill's design capacity and the maximum amount of solid waste a landfill is authorized to accept. Owners of landfills with a design capacity greater than or equal to 2.75 million tons or 88 million cubic feet must also submit periodic emissions reports. In addition, landfills with a design capacity equal or greater than 2.75 million tons or 88 million cubic feet and emitting 55 tons per year or more of non-methane organic compounds are required to have an emissions collection and control system. Subpart WWW also specifies emission testing, record keeping and reporting requirements.

Supart WWW also requires a landfill gas (LFG) collection system to collect the non-methane organics from the landfill and route them to a treatment system that processes the gas. The system must be monitored for emissions from vents which must be flared or reduced by 98 weight percent or emitted at a concentration less than 20 parts per million (ppm) on a dry basis as hexane at three percent oxygen.

In addition, Subpart WWW requires MSW landfill owners or operators to submit a plan to minimize dust on site which becomes part of the Solid Waste Facilities Permit when issued. Opacity from the dust must be no greater than 20 percent. The plan must include control strategies to reduce dust from roads, construction, operations, and covering wastes. The steps to minimize fugitive dust may include but are not limited to watering and/or chemical stabilization, and providing vegetative or synthetic cover and windbreaks.

The proposed Gregory Canyon Landfill would have a design capacity greater than 2.75 million tons and, therefore, would be subject to NSPS Subpart WWW. The project incorporates project design features to comply with the requirements under this subpart. The proposed landfill would be constructed in a canyon, which would make it easier to contain and collect LFG. The project would have a clay liner and would use a new, state-of-the-art LFG gas collection system. Periodic monitoring of the cover and perimeter monitoring would be performed to ensure that there are no leaks. The project as proposed would comply with NSPS Subpart WWW. The project would be subject to additional evaluation during the SDAPCD air permitting process.

Although stationary source emissions of $NO_x$ and VOC at the Gregory Canyon Landfill do not exceed the applicability threshold limit of 50 tons per year for “serious” ozone non-attainment areas, under Part 70 (Title V Program), all landfills subject to Subpart WWW with a design capacity greater than or equal to 2.75 million tons may be subject to Part 70 permitting requirements.

PART 72—(Acid Rain Program) will not apply to the Gregory Canyon Landfill because the stationary source emissions do not meet the requirements of an affected source, as found in Subpart A—Acid Rain Program General Provisions; and Subpart G—Acid Rain Phase II implementation, as related to Title V operating permit programs. Part 72.6(8)—Applicability exempts non-utility units from the Acid Rain Program.

<u>California Clean Air Act</u>

The Federal Clean Air Act allows states to adopt ambient air quality standards and other regulations, provided they are at least as stringent as the federal standards. The California State Air Resources Board (CARB) was established in 1957 by the State Legislature, to establish ambient air quality standards (among other mandates). The CAAQS include the federal criteria pollutants and additional standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility reducing particles, are presented in Table 4.7-1.

The CARB is the State agency with authority to enforce regulations to achieve and maintain the CAAQS, except in areas where the local air quality management district has been given authority for permitting and managing the compliance of stationary source emissions. The CARB maintains regulatory authority over mobile source emissions statewide. The CARB required each air basin to develop its own strategy for achieving the NAAQS and CAAQS. The CARB maintains the authority to review and approve these strategies.

In addition to authority over sources of criteria pollutants, the CARB maintains an advisory role in administering state regulations such as the 1987 Air Toxics "Hot Spots" Information and Assessment Act (AB 2588). AB 2588 requires major sources to quantify and report to the local air quality management district emissions of hazardous air pollutants as defined by the regulations. In cases where the emissions exceed locally established threshold levels, facilities have been required to prepare health risk assessments in accordance with guidelines established by the California Air Pollution Control Officers' Association (CAPCOA), and to notify the public if the excess cancer risk associated with the facility's emissions exceed ten in 1,000,000 (one in 100,000). Facilities are required to update the air toxics emission inventories biannually.

The California Integrated Waste Management Board (CIWMB) has statewide responsibility for overseeing the implementation of the minimum regulatory operating standards for solid waste handling and disposal facilities in California under the California Code of Regulations Title 14. The CIWMB regulations include operational standards for controlling odors and fugitive dust emissions from solid waste facilities.

Local Regulations

The San Diego Air Pollution Control District (SDAPCD) is the local agency that is responsible for achieving and maintaining the CAAQS and the NAAQS in the San Diego Air Basin. The SDAPCD was responsible for preparing the San Diego portion of the SIP, which presents the air basin's strategies for achieving the federal ambient standards. The SIP for the San Diego Air Basin was approved by EPA in July, 1997.

The SDAPCD also has the authority to adopt and enforce regulations dealing with new source review, emissions of hazardous air pollutants, and controls for specific types of sources. The proposed project will require an Authority to Construct permit from SDAPCD. The authority of the SDAPCD to grant permits is established in Rule 20. Applicable New Source Review requirements are contained in Rules 20.1, 20.2, 20.3, and 20.10. Rule 20.1 provides general provisions related to Rule 20 and includes (applicable) emission calculation procedures. Rules 20.2 and 20.3 provide specific requirements for non-major and major sources and include standards for Best Available Control Technology (BACT), Lowest Achievable Emission Rate (LAER), Air Quality Impact Analysis (AQIA), and for public notification.

Rules 20.2 and 20.3 establish a daily emission trigger level of 10 pounds per day or more of $PM_{10}$, $NO_x$, VOC or $SO_x$ for requiring Best Available Control Technology (BACT). BACT requires the most stringent emission limitation, or most effective emission control device, or control technique, which has proven field application and which is cost-effective for such emitting source. New or modified major sources require LAER, the most stringent emission limitation, or most effective emission control device or control technique contained in any SIP approved by the EPA for such source. Rules 20.2 and 20.3 identify "triggering" emission levels for both hourly and daily periods that require an AQIA for a proposed source. Area fugitive emissions of $PM_{10}$ must be analyzed when the SDAPCD determines, on a case-by-case basis, that the analysis is necessary in order to protect public health and welfare. The trigger levels are the same for both rules and are used as Significance Criteria for the proposed project, as described in Section 4.7.2.

Rule 20.3 requires that new stationary sources that emit more than 50 tons per year of either $NO_x$ or VOC must provide emission offsets at a ratio of 1.2 to 1 to the source's actual emissions, regardless of the results of an AQIA. The offset requirement assures that all significant stationary sources of non-attainment pollutants will be completely mitigated. This requirement is not applicable to the project since $NO_x$ emissions from stationary sources would not exceed 50 tons per year.

Rules 20.2 and 20.3 also provide provisions for public involvement and include requirements for the public comment period, applicant responses, publication of notice, and information to be made available for public inspection.

As discussed above, the project as proposed will comply with BACT requirements and an AQIA has been conducted as part of this Final EIR. However, the proposed project will be subject to additional evaluation during the SDAPCD air permitting process and the project would have to satisfy all provisions of Rule 20 prior to issuance of a permit.

Rule 50 prohibits excess visible emissions, while Rules 52, 53, and 54 limit the allowable amount of particulate matter emitted from stacks.

Rule 59, "Control of Waste Disposal Site Emissions," provides specific requirements for landfills and has similar requirements to NSPS Subpart WWW, discussed above. The rule essentially requires that landfills be equipped with a gas control system, and that sampling probes be installed to determine whether underground off-site gas migration could occur. The rule also describes specific compliance testing, record keeping and reporting requirements for landfills. As discussed above, the project as proposed would comply with these requirements, and would be subject to additional evaluation during the SDAPCD air permitting process.

Rule 59.1, "Municipal Solid Waste Landfills" implements federal mandates to control air emissions from landfills within San Diego County. Rule 59.1 incorporates by reference many of the detailed requirements of Subpart WWW. However, this rule does not apply to any new MSW landfill subject to the requirements of NSPS Subpart WWW (40 CFR 60.750) and, therefore, the rule does not apply to the proposed project.

Neither the EPA nor the CARB have established ambient air quality criteria for odors. The SDAPCD has adopted a nuisance rule which is used to provide protection to the public from odors. The SDAPCD Rule 51, "Nuisance," which is identical to the State Health and Safety Code Section 41700, reads as follows:

> "A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health, or safety of any such persons or the public or which cause or have a natural tendency to cause injury or damage to business or property.
>
> The provisions of this rule shall not apply to odors emanating from agricultural operations necessary for the growing of crops or the raising of fowls or animals."

SDAPCD Rule 1200 is also applicable to the proposed project. This rule stipulates that, as part of the new source review process, proposed facilities with potential emissions of hazardous air pollutants are required to conduct a Health Risk Assessment (HRA) to evaluate off-site impacts of such emissions on human health. An air toxics HRA was conducted as part of this Final EIR and a discussion of the analysis is included in Section 4.7.3.5 of this EIR.

### 4.7.1.3 Existing Regional Air Quality

On-site air quality data are not available for the Gregory Canyon site. The closest SDAPCD air quality monitoring station is in Escondido. This station monitors $O_3$, CO, $NO_2$, $PM_{10}$ and $PM_{2.5}$. $SO_2$ is not monitored at this location. Table 4.7-3 presents a summary of the highest pollutant concentrations recorded at this station. The air quality in northern San Diego County met Federal standards for CO, $NO_2$, $SO_2$, and $PM_{10}$ between 1996 and 2000, but exceeded the federal $O_3$ eight-hour standard in 1996, 1997, 1998, and 2000. The air quality met the applicable state CO standards for all years, but exceeded the state $O_3$ and $PM_{10}$ standards from 1996 to 2000.

Ambient concentrations collected at Escondido from 1996-2000 show that the State 24-hour $PM_{10}$ standard of 50 $\Phi g/m^3$ was exceeded approximately three percent of the time or 12 days per year, exceeded 40 $\Phi g/m^3$ approximately nine percent of the time or 33 days per year, and exceeded 30 $\Phi g/m^3$ approximately 33 percent of the time or 119 days per year.

### 4.7.1.4 Existing Local Air Quality

Local air quality is most often a major concern along roadways, where CO is a primary pollutant. Unlike $O_3$, CO is directly emitted from a variety of sources, the most notable of which is motor vehicles. For this reason, CO concentrations are usually indicative of the local air quality impacts generated by a roadway network and are often used to assess the impact of vehicular emissions on the local air quality.

The intersections at which existing CO concentrations were modeled are shown in Exhibit 4.7-3.

The maximum CO concentration for each modeled intersection is shown in Table 4.7-4. The results indicate that existing CO concentrations comply with state and federal standards.

## 4.7.2 SIGNIFICANCE CRITERIA

### 4.7.2.1 Air Quality

The SDAPCD has not developed any specific guidance for evaluating the significance of air quality impacts under CEQA. However, the project may be considered to have the potential for significant air impacts if project related emissions exceed the Air Quality Impact Analysis (AQIA) trigger levels identified in SDAPCD Rules 20.1, 20.2 and 20.3, shown in Table 4.7-5. These hourly, daily and annual emission thresholds have been used in this analysis as the air quality significance criteria for all emission sources at the landfill.

However, if the AQIA trigger levels shown in Table 4.7-5 are exceeded, a project’s impact may not be considered significant, if it can be shown through dispersion modeling that the project would not:

- Cause a violation of a state or national ambient air quality standard anywhere that does not already exceed such standard, nor
- Cause additional violations of a state or national ambient air quality standard anywhere the standard is already being exceeded, nor
- Prevent or interfere with the attainment or maintenance of any state or national ambient air quality standard.

**TABLE 4.7-3**
**AMBIENT AIR QUALITY SUMMARY—ESCONDIDO MONITORING STATION**

| | | CALIFORNIA AMBIENT | NATIONAL AMBIENT | MAXIMUM CONCENTRATION [a] | | | | | NUMBER OF DAYS EXCEEDING FEDERAL STANDARD [b] | | | | | NUMBER OF DAYS EXCEEDING STATE STANDARD [b] | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| POLLUTANT | AVERAGE TIME | AIR QUALITY STANDARDS | AIR QUALITY STANDARDS | 1996 | 1997 | 1998 | 1999 | 2000 | 1996 | 1997 | 1998 | 1999 | 2000 | 1996 | 1997 | 1998 | 1999 | 2000 |
| $O_3$ | 1 hr. | 0.09 ppm | 0.12 ppm | 0.12 | 0.11 | 0.12 | 0.10 | 0.12 | 0 | 0 | 0 | 0 | 0 | 12 | 5 | 9 | 1 | 6 |
| $O_3$ | 8 hrs. | 0.08 | N/A | 0.10 | 0.09 | 0.09 | 0.08 | 0.11 | 9 | 2 | 5 | 0 | 3 | N/A | N/A | N/A | N/A | N/A |
| CO | 1 hr. | 20 ppm | 35 ppm | 11.2 | 9.3 | 10.2 | 9.9 | 9.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | 8 hrs. | 9.0 ppm | 9 ppm | 7.1 | 4.9 | 4.5 | 5.3 | 4.9 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $NO_2$ | 1 hr. | 0.25 ppm | N/A | 0.10 | 0.12 | 0.09 | 0.10 | 0.08 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Annual | N/A | 0.053 ppm | 0.020 | 0.021 | 0.018 | 0.023 | 0.021 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $SO_2$[c] | 1 hr. | 0.25 ppm | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | 24 hrs. | 0.04 ppm | 0.14 ppm | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| | Annual | N/A | 0.03 ppm | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| $PM_{10}$[d] | 24 hrs. | 50 $\mu g/m^3$ | 150$\mu g/m^3$ | 53 | 63 | 51 | 52 | 65 | 0 | 0 | 0 | 0 | 0 | 2 | 3 | 1 | 1 | 2 |
| | Annual | 30 $\mu g/m^3$ | 50$\mu g/m^3$ | 28 | 29 | 21 | 27 | 25 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| $PM_{2.5}$ | 24 hrs. | N/A | 65 $\mu g/m^3$ | N/A | N/A | N/A | 64 | 66 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |

N/A = not applicable.

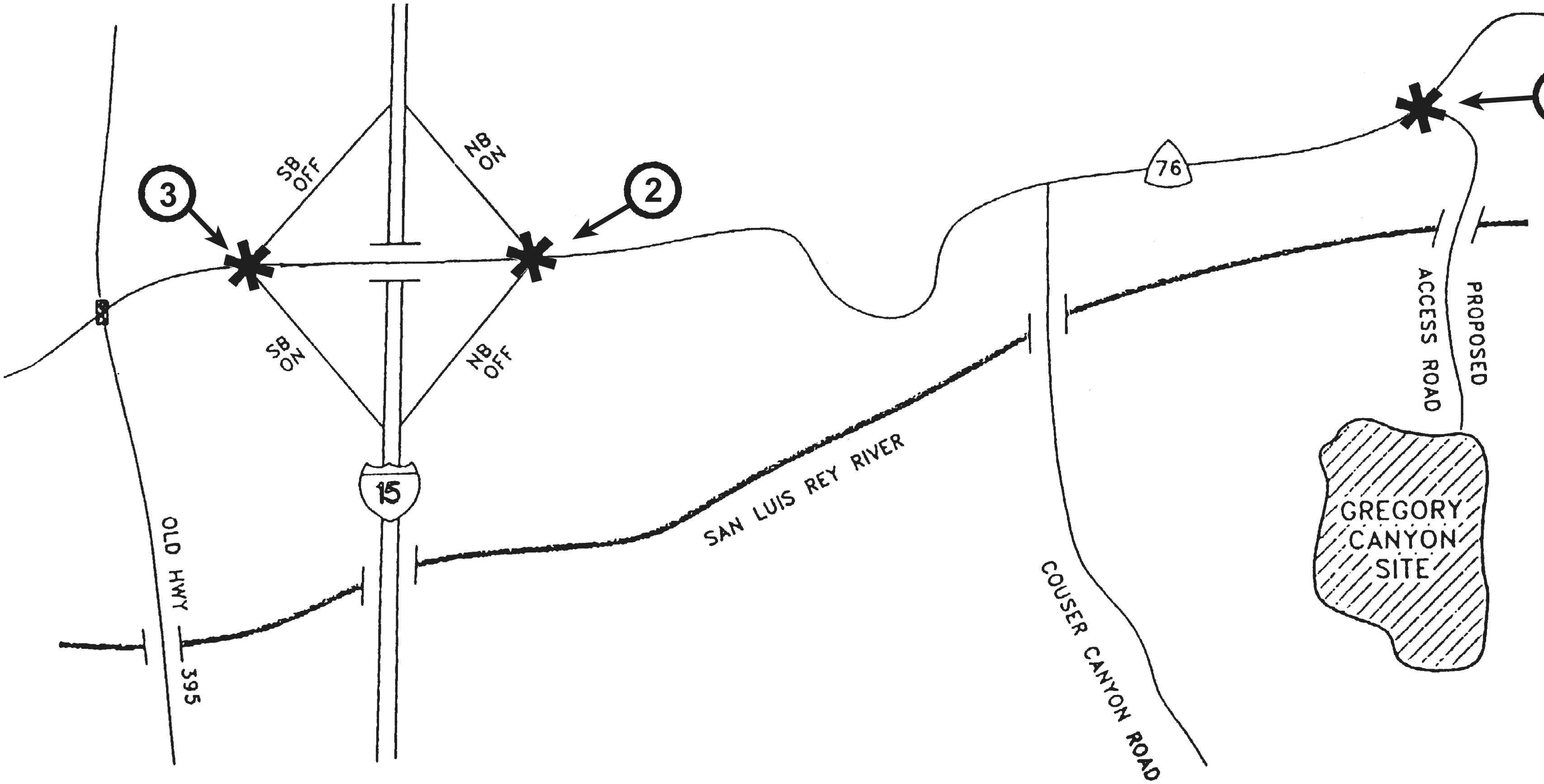
[a] Maximum concentration units for $O_3$, CO, $NO_2$, and $SO_2$ are parts per million (ppm). Concentration units for $PM_{10}$ and $PM_{2.5}$ are micrograms per cubic meter ($\mu g/m^3$).

[b] For annual standards, a value of "1" indicates the standard has been exceeded.

[c] Sulfur dioxide was not measured at Escondido.

[d] In July 1987, the federal standards for TSP were replaced by standards for $PM_{10}$. $PM_{10}$ was not monitored at this station before 1993. $PM_{10}$ is only measured every sixth day. Therefore, if the standard was exceeded for five days, it would imply that the standards are exceeded about eight-percent of the days. The maximum reported concentration is based on the fourth highest 24-hr concentration. Attainment with the standard is demonstrated when 99-percent of the daily concentrations, averaged over three years, are equal to or less than the standard.

*Source: SDAPCD and CARB 1996, 1997, 1998, 1999 and 2000*

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NOT TO SCALE

Sources: Mestre Greve Associates, 1999; David Evans and Associates Inc., 1999

Exhibit 4.7-3
**CALINE 4**
**Receptor Sites**

**TABLE 4.7-4**
**MODELED CARBON MONOXIDE CONCENTRATIONS FOR EXISTING TRAFFIC CONDITIONS**

| RECEPTOR LOCATION NO. | RECEPTOR LOCATION DESCRIPTION | 1-HOUR (PPM)[a] | 8-HOUR (PPM)[a] |
|---|---|---|---|
| 1 | SR 76/I-15 northbound ramp | 9.4 | 5.5 |
| 2 | SR 76/proposed access road | 8.8 | 5.3 |
| 3 | SR 76/I-15 southbound ramp | 9.7 | 5.7 |
| | Federal standard | 35 | 9 |
| | State standard | 20 | 9 |

ppm = parts per million
[a] The CO concentrations include baseline concentrations of 8.5 ppm for one-hour levels and 5.1 ppm for eight-hour levels based on 2001 data from the Escondido monitoring station.
*Sources: Table 4.7-1 and PCR Services Corporation, 2002*

**TABLE 4.7-5**
**SIGNIFICANCE THRESHOLDS**

| AIR CONTAMINANT | AQIA TRIGGERS (lb/hour) | AQIA TRIGGERS (lb/day) | AQIA TRIGGERS (tons/yr) | OFFSET TRIGGER (tons/yr) |
|---|---|---|---|---|
| Particulate Matter ($PM_{10}$) [a] | | 100 | 15 | |
| Oxides of Nitrogen ($NO_X$) | 25 | 250 | 40 | 50 |
| Volatile Organic Compounds (VOC) | | | | 50 |
| Oxides of Sulfur ($SO_X$) | 25 | 250 | 40 | |
| Carbon Monoxide (CO) | 100 | 550 | 100 | |
| Lead (Pb) | | 3.2 | 0.6 | |

[a] Process emissions only, excludes area fugitive emissions.
*Source: SDAPCD Rules 20.1, 20.2, and 20.3*

A second threshold for significance of stationary sources at the facility are the offset requirement trigger levels also found in Table 4.7-5.

Because San Diego County is a serious non-attainment area for $O_3$, stationary sources which would emit more than 50 tons/yr of either $NO_x$ or VOC must provide emission offsets to the air basin at a ratio of 1.2 to 1 to the source's actual emissions, regardless of the results of an AQIA. The offset requirement assures that all significant stationary sources of non-attainment pollutants will be completely mitigated. Therefore, if project related emissions (both stationary, fugitive and mobile source) of these pollutants exceed the offset thresholds the impact would be significant.

### 4.7.2.2 Odor

Absent significance criteria for odor in CEQA, by EPA or the CARB, the SDAPCD's Rule 51, "Nuisance," (State Health and Safety Code Section 41700) and the County of San Diego Zoning Ordinance 6318 "Odors" are used as the criteria for assessing odors from the project. The project will have an adverse odor impact if the project results in:

- A discharge of quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons; or

- A discharge of quantities of air contaminants or other material which endangers the comfort, repose, health, or safety of any persons; or
- A discharge of quantities of air contaminants or other material which cause or have a natural tendency to cause injury or damage to any business or property; or
- A discharge of quantities of air contaminants which cause unpleasant odors that are perceptible by the average person at or beyond the property line.

### 4.7.2.3 Health Risk Assessment (HRA)

Individual cancer risk is typically expressed as the increased or excess chances in a million of developing cancer over an assumed 70-year lifetime of constant exposure. The SDAPCD has determined that the significance criterion for cancer health risks conducted pursuant to the California Air Toxics "Hotspots" Assessment and Information Act (AB 2588) is a ten in 1,000,000 (also expressed as one in 100,000 ($1 \times 10^{-5}$ or 0.00001)) chance of developing cancer. Similarly, APCD Rule 1200 uses $1 \times 10^{-5}$ as an acceptable cancer risk criterion in the District's New Source Review process, provided the project in question employs Toxics Best Available Control Technology (TBACT). It was assumed for this analysis under CEQA that the proposed Gregory Canyon project will utilize TBACT, including a high efficiency landfill gas collection system, diesel particulate control devices for on-site heavy-duty equipment, and measures to minimize dust generation on unpaved and paved surfaces. Accordingly, this level of risk is assumed as the screening significance criterion in this analysis. Ultimately, the determination of TBACT and the use of this criterion will be determined by SDAPCD as part of an evaluation of an application for an authority to construct and/or permit to operate.

The significance of non-cancer (acute and chronic) risks is evaluated in terms of calculated hazard indices (HI) for different toxic endpoints, which are the sums of the ratios of expected maximum short- or long-term concentrations to the respective allowable exposure levels determined for each pollutant by the State of California Office of Environmental Health Hazard Assessment (OEHHA). SDAPCD suggests that the acceptable HI level at any toxic endpoint for both acute and chronic noncarcinogenic indices is 1.0, and this criterion has been applied in this assessment to evaluate the significance of predicted non-cancer risks.

## 4.7.3 POTENTIAL IMPACTS

The proposed landfill, including facilities construction, landfill operations, rock processing and transport off-site, and landfill gas generation, has the potential to adversely affect air quality through the generation of fugitive dust, odors, and/or criteria and toxic air contaminants.[1] The analysis contained in this section includes an evaluation of potential air quality impacts due to each of these sources, as well the impacts of traffic generated by the proposed project and cumulative impacts to air quality from the combination of the proposed project with other projects in the vicinity. Finally, this section presents the findings of an air toxics health risk assessment (HRA) that has been conducted to evaluate potential health effects due to the operation of the proposed landfill project.

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[1] A portion of the excavated rock may be transported off-site for sale as crushed rock, base rock, and construction-grade material. However, the applicant will be required to obtain a Major Use Permit (MUP) for rock export or sale, as necessary. (An exemption may apply for initial construction.)

The analysis was prepared in accordance with the application evaluation procedures of the SDAPCD and the emission factors presented in the EPA's, "Compilation of Air Pollution Emission Factors" or "AP-42" (with revisions through 1998). Emission estimates prepared for each phase of the proposed project and for each source are compared with the significance criteria. The evaluation of potential project impacts is organized according to the following topical areas:

- Short-term construction impacts—criteria pollutants
- Long-term operational on-site impacts—criteria pollutants
- Regional and local impacts due to project-related vehicle traffic
- Odor impacts
- Air toxics health risks—toxic air contaminants

A detailed discussion of the features incorporated into the design of the project to reduce air quality impacts is provided in Chapter 5 of Appendix K of this EIR. Emission inventory and dispersion modeling methodologies are provided in Chapter 6 of Appendix K.

### 4.7.3.1 Short-Term (Initial) Construction Impacts—Criteria Pollutants

Initial construction of the proposed project would consist of the following activities: (1) construction of the access road, bridge and ancillary facilities; (2) improvements to SR 76; (3) cell development including excavation of the initial landfill cell and installation of the associated clay liner; and (4) rock crushing operations.[2] Excavation of the initial landfill cell would require minimal blasting. The initial construction period would be approximately nine to twelve months in duration and would occur ten hours per day, six days per week. During initial construction 1.8 mcy of material would be excavated. This excavation will include the ancillary facilities and waste cell sufficient to handle the first three to four years of landfill operations.

Emissions associated with landfill construction will include respirable particulate matter ($PM_{10}$), oxides of nitrogen ($NO_x$), oxides of sulfur ($SO_x$), carbon monoxide (CO), volatile organic compounds (VOC), and air toxics.

Table 4.7-6 compares estimates of initial construction emissions with the air quality significance criteria that were described in Section 4.7.2.1. Emissions of $SO_X$ would be below the applicable AQIA trigger levels and would therefore, not be considered significant. $PM_{10}$, CO, and $NO_x$ emissions during the initial construction would exceed the applicable AQIA trigger levels. Secondarily, $NO_x$ emissions also exceed the SDAPCD offset trigger thresholds and are considered significant. $PM_{10}$ emissions, as they are substantially over the relative SDAPCD AQIA trigger threshold are also considered significant.

The worst case daily emissions defined in Table 4.7-6 were analyzed for their impact on off-site ambient pollutant concentrations using the USEPA ISCST model, and meteorological data collected from Miramar Marine Corps Air Station for the 1993-1995 period. Detailed discussion of modeling methodology and related modeling results are presented in Chapter 6 of Appendix K to this Final EIR. This worst-case analysis considered all emission sources combined. As presented in Table 4.7-7, project impacts from CO and $NO_x$ emissions would not cause any

2 A portion of the excavated rock may be transported off-site for sale as crushed rock, base rock, and construction-grade material. A MUP will be obtained, as necessary.

**TABLE 4.7-6**
**SUMMARY OF SHORT-TERM (CONSTRUCTION PHASE) EMISSIONS**

| | (LBS/DAY) | | | | | (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **EMISSION SOURCES** | **CO** | **ROC** | **$NO_X$** | **$SO_X$** | **$PM_{10}$** | **CO** | **ROC** | **$NO_X$** | **$SO_X$** | **$PM_{10}$** |
| | | | | | | | | | | |
| **Initial Construction** | | | | | | | | | | |
| Equipment Exhaust | | | | | | | | | | |
| Off-Road Vehicle Exhaust | 256 | 47 | 553 | 12 | 3 | 39.3 | 7.3 | 84.9 | 1.8 | 0.5 |
| On-Road Vehicle Exhaust[a] | 235 | 27 | 157 | N/A | 8 | 21.6 | 2.5 | 13.8 | N/A | 0.3 |
| Fugitive Emissions | | | | | | | | | | |
| Fugitive Dust—Construction | 536 | | 136 | 16 | 276 | 4.6 | | 1.2 | 0.1 | 40.0 |
| Fugitive Dust—Rock Processing | | | | | 8 | | | | | 0.7 |
| Fugitive Dust—Wind Erosion | | | | | 10 | | | | | 1.8 |
| Travel on Roads | | | | | | | | | | |
| Vehicle Travel on Unpaved Roads | | | | | 47 | | | | | 4.8 |
| Vehicle Travel on Paved Roads | | | | | 11 | | | | | 1.0 |
| | | | | | | | | | | |
| **Subtotal** | **1027** | **74** | **845** | **28** | **363** | | **9.7** | **99.8** | **1.9** | **49.2** |
| | | | | | | | | | | |
| Existing On-Site Emissions (Verboom Dairy Farm) | | | | | | | | | | -22.4 |
| | | | | | | | | | | |
| **Net Emissions** | **1027** | **74** | **845** | **28** | **363** | **65.4** | **9.7** | **99.8** | **1.9** | **26.8** |
| Significance Threshold (AQIA Triggers) | 550 | -- | 250 | 250 | 100 | 100 | -- | 40 | 40 | 15 |
| Potentially Significant | yes | -- | yes | no | yes | no | -- | yes | no | yes |
| | | | | | | | | | | |
| Secondary Significance Threshold (offset triggers) | -- | -- | -- | -- | -- | -- | 50 | 50 | -- | -- |
| Significant | -- | -- | -- | -- | -- | -- | no | yes | -- | -- |

CO = carbon monoxide; VOC = volatile organic compounds; $NO_X$ = nitrogen oxides; $SO_X$ = sulfur oxides; $PM_{10}$ = particulate matter of ≤10 microns.

[a] Includes exhaust emissions from both on- and off-site haul trucks. If off-site transport of rock does not occur, on-road regional vehicle exhaust emissions would decrease by 37, 4, 14, and 0.6 pounds per day of CO, ROC, $NO_x$, and $PM_{10}$, and 13.8, 0.4, 1.5, and 0.02 tons per year of CO, ROC, $NO_x$, and $PM_{10}$, respectively. Fugitive dust emissions would be expected to be similar since the material would be hauled on-site regardless.

*Source: PCR Services Corporation, April 2002* exceedances of any of the applicable ambient air quality standards. However, since $NO_x$ is a pre-cursor to the formation of ozone and the Basin is non-attainment for ozone, the project would contribute incrementally to regional ozone and would therefore result in a significant air quality impact.

**TABLE 4.7-7**
**INITIAL CONSTRUCTION IMPACTS ON AMBIENT POLLUTANT CONCENTRATIONS**

| | CO | | $NO_2$ | | Off-Site $PM_{10}$ | Closest Residence $PM_{10}$ |
|---|---|---|---|---|---|---|
| | 1-hour (PPM) | 8-hour (PPM) | 1-hour (PPM) | Annual (PPM) | 24-hr ($\mu g/m^3$) | 24-hr ($\mu g/m^3$) |
| Project Impacts | 0.5 | 0.12 | 0.051 | 0.01 | 49 | 13.5 |
| Ambient (Escondido Monitoring Station ’96-’00) | 11.2 | 7.1 | 0.12 | 0.023 | 65 | 65 |
| Total | 11.7 | 7.2 | 0.17 | 0.033 | 114 | 78.5 |
| Most Stringent AAQS | 20 | 9 | 0.25 | 0.053 | 50 | 50 |
| Significant | No | No | No | No | Yes | Yes |
| | | | | | | |

[a] Impact is based on the 99-percent maximum daily concentration, per AAQS.
*Source: PCR Services Corporation, June 2002*

As shown in Table 4.7-7, worst-case daily $PM_{10}$ emissions have the potential to increase the number of exceedances of the more stringent State standard of 50 $\mu g/m^3$ but would not exceed the national standard of 150 $\mu g/m^3$ and would have a maximum off-site impact of 114 $\mu g/m^3$. The maximum impacted receptor was located directly northeast of the ancillary facilities in which no exposed individuals would be located for a duration of 24-hours. The maximum impacted residence was located directly south of the landfill footprint and would have a maximum impact of 79 $\mu g/m^3$. Concentrations of $PM_{10}$ are directly related to the distance from the emissions source, and therefore, modeled impacts to residences further away from the project site were substantially less than impacts identified for this maximum impacted residence.

A detailed analysis of the worst-case modeled year was conducted to further quantify the number of project related exceedances of the State standard. An annual profile was developed which shows the 24-hour concentration for each day of the year by receptor. Therefore, to determine the number of days that the project area would exceed the State standard this analysis looked at the number of days that project related emissions would incrementally add to background ambient concentrations and cause additional exceedances of the State standard. The results of this analysis are presented in Table 4.7-8 and show that the proposed project could cause 95 additional exceedances of the State 24-hour standard at the maximum off-site receptor and eight additional exceedances of the State 24-hour standard at the maximum impacted residence per year, in addition to the average 12 days per year that already occur in the project area without the project. Therefore, the project would result in a significant air quality impact since project-related emissions of $PM_{10}$ have the potential to cause additional violations of the California Ambient Air Quality Standard for $PM_{10}$.

**TABLE 4.7-8**
**$PM_{10}$ INITIAL CONSTRUCTION IMPACTS**
**(NUMBER OF ADDITIONAL EXCEEDANCES OF THE STATE 24-HR $PM_{10}$ STANDARD)**

| | Maximum Off-Site Impact (days per year) | Maximum Impacted Residence (days per year) |
|---|---|---|
| Background Ambient (>40 $\mu g/m^3$)[1] | 33 | 33 |
| Project Impact (>10 $\mu g/m^3$) | 95 | 8 |
| **# of Exceedances of State Standard (>50 $\mu g/m^3$)** | **33** | **8** |
| | | |
| Background Ambient (>30 $\mu g/m^3$)[1] | 119 | 119 |
| Project Impact (>20 $\mu g/m^3$) | 41 | 1 |
| **# of Exceedances of State Standard (>50 $\mu g/m^3$ )** | 41 | **1** |
| | | |
| **Maximum # of Exceedances of State Standard** | **41** | **8** |
| | | |

[1] Background ambient concentrations of $PM_{10}$ are based on the closest and most representative SDAPCD air quality monitoring station in Escondido.
*Source: PCR Services Corporation, June 2002*

These estimates are based on conservative estimates of construction activity which assume that all construction activities would occur at their maximum daily output. These activities include excavation of the landfill cell, rock crushing, installation of the clay liner, and construction of the access road, bridge, and ancillary facilities. These activities would be staged so that they would not all occur on the same day and would be spread out throughout the construction period over a much lower activity level. Therefore, actual impacts would be expected to be much lower. Please see Appendix K for a detailed discussion of the analysis.

Table 4.7-9 presents the summary of significance for the projects initial construction phase. As presented in this table, emissions of CO, VOC, and $SO_X$, are not significant, while emissions of $NO_X$, and $PM_{10}$ are concluded to pose significant air quality impacts. Measures to reduce emissions of $NO_X$ and $PM_{10}$ during construction are identified in Section 4.7-4.

**TABLE 4.7-9**
**SUMMARY OF IMPACTS RELATED TO CONSTRUCTION**

| Pollutant | Significant | Reason |
|---|---|---|
| CO | No | Project related emissions do not cause an exceedance of any AAQS. |
| VOC | No | Below SDAPCD Rule 20 offset requirements[a] |
| $NO_X$ | Yes | Above SDAPCD Rule 20 offset requirements[a] |
| $PM_{10}$ | Yes | Has the potential to cause additional violations of the CAAQS. |
| $SO_X$ | No | Does not exceed the relative AQIA trigger level |

[a] Mobile source emissions were included for purposes of CEQA evaluation. However, SDACPD Rule 20 offset requirements are typically only for permitted sources (i.e., fugitive emissions from the landfill surface and landfill flare) and will be re-evaluated during the permitting process.
*Source: PCR Services Corporation, June 2002*

## 4.7.3.2 Long-Term On-Site Operational Impacts

The two broad activities associated with the operation of the Gregory Canyon Landfill would include landfill operations and periodic landfill development. Landfill operations would consist of transport, receipt and placement of waste, application of daily cover, and the collection and destruction of landfill gas (LFG). After the initial startup of the operation, landfill development would occur as periods of additional excavation, compaction of subgrade soils, and installation of a composite liner. All of the activities would generate exhaust emissions and fugitive dust due to the operation of vehicles hauling waste, performing construction tasks, crushing rock and transporting excess aggregate off-site for sale, and traveling to and from the facilities.

Project Operations and Periodic Construction

Emissions associated with landfilling and rock processing operations include heavy equipment emissions, vehicle exhaust emissions from trash trucks, employee, and public travel to and from the landfill, fugitive dust generation from operations at the active face of the landfill, fugitive dust from vehicle travel on unpaved roads, rock processing and transport off-site, landfill gas, and combustion of collected gas by the flare. The Air Quality Technical Report (Appendix to this Final EIR) includes worksheets and detailed explanations of the procedures used to calculate the criteria pollutant emissions for each of these source categories.

In order to ensure that the maximum potential air quality impacts of the proposed project would be addressed, "worst case" daily and annual emission estimates were developed for all thirty (30) years of landfill and rock processing operations. Peak activity levels for all sources were assumed in estimating maximum daily pollutant emissions for the proposed landfill. These included the maximum traffic generation scenario developed by Darnell & Associates (see Appendix I of the December 1999 Revised Draft EIR) and the peak-year landfill gas generation rate calculated based upon EPA AP-42 methodology. Detailed landfill gas generation calculations are provided in the Appendix of this Final EIR. Maximum daily operational emissions were projected for a worst case landfill waste delivery rate of 5,000 tons per day. For annual emissions estimates, an average waste delivery rate of 3,200 tons per day was assumed.

Subsequent to the evaluation of the project's 30-year emission profile, years 19 and 30 of landfill and rock processing operations were identified as the years with the largest project related emissions. The last phase of periodic construction begins in year 19 with 1.2 mcy to be excavated in addition to landfill operations with waste being disposed the furthest distance in the footprint. In year 30, the maximum amount of landfill gas will be generated. Emissions of criteria air pollutants for years 19 and 30 of operation are presented in Table 4.7-10 and Table 4.7-11, respectively. Both tables compare all project related emissions to the relative significance thresholds as presented in Section 4.7.2.1. As shown in Table 4.7-10, projected maximum emissions of CO, $PM_{10}$ and $NO_x$ would be above the corresponding AQIA trigger levels. $NO_x$ emissions of both stationary and mobile sources would also exceed the SDAPCD offset threshold, and are therefore considered significant. $PM_{10}$ emissions, as they are substantially over the relative SDAPCD AQIA trigger threshold, in both years 19 and 30 of operation, are similarly considered potentially significant.

The worst case daily emissions defined in Tables 4.7-10 and 4.7-11 for years 19 and 30, respectively, were analyzed for their impact on offsite ambient pollutant concentrations using the USEPA ISCST model, and meteorological data collected from Miramar Marine Corps Air Station for the 1993-1995 period. Detailed discussion of modeling methodology and related modeling results are presented in Appendix K of this Final EIR. As presented in Tables 4.7-12 and 4.7-13 for years 19 and 30, respectively, project impacts from CO and $NO_x$ emissions would not cause any exceedances of any of the applicable ambient air quality standards. However, since $NO_x$ is a pre-cursor to the formation of ozone and the Basin is non-attainment for ozone,

**TABLE 4.7-10**
**SUMMARY OF OPERATIONAL EMISSIONS (YEAR 19)**

| | (LBS/DAY) | | | | | (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **EMISSION SOURCES** | **CO** | **VOC** | **$NO_X$** | **$SO_X$** | **$PM_{10}$** | **CO** | **VOC** | **$NO_X$** | **$SO_X$** | **$PM_{10}$** |
| | | | | | | | | | | |
| **Landfill Operations** | | | | | | | | | | |
| Equipment Exhaust | 134 | 27 | 214 | 4 | 2 | 20.6 | 4.1 | 32.9 | 0.5 | 0.2 |
| Vehicle Exhaust[a] | 327 | 22 | 105 | N/A | 3 | 31.0 | 2.1 | 9.8 | N/A | 0.3 |
| Fugitive Dust—Cover Operations | | | | | 26 | | | | | 1.9 |
| Fugitive Dust—Wind Erosion from Stockpiles | | | | | 12 | | | | | 2.2 |
| Vehicle Travel on Unpaved Roads | | | | | 4 | | | | | 0.4 |
| Vehicle Travel on Paved Roads | | | | | 71 | | | | | 7.5 |
| Flare and Landfill Emissions | | | | | 40 | | | | | 7.4 |
| **Subtotal for Operations** | **593** | **194** | **421** | **33** | **158** | **75.6** | **32.7** | **61.1** | **6.0** | **19.0** |
| | | | | | | | | | | |
| **Periodic Construction** | | | | | | | | | | |
| Off-road Vehicle Exhaust | 143 | 19 | 278 | 7 | 2 | 12.9 | 1.7 | 25.0 | 0.6 | 0.2 |
| Fugitive—Construction | 536 | | 136 | 16 | 282 | 20.4 | | 5.2 | 0.6 | 25.3 |
| Fugitive Dust—Rock Processing | | | | | 8 | | | | | 0.5 |
| Vehicle Travel on Unpaved Roads | | | | | 6 | | | | | 0.4 |
| Vehicle Travel on Paved Roads | | | | | 11 | | | | | 0.7 |
| **Subtotal for Construction** | **679** | **19** | **414** | **23** | **310** | **33.2** | **1.7** | **30.2** | **1.2** | **27.0** |
| **Subtotal (Operations + Construction)** | **1,272** | **213** | **835** | **56** | **468** | **108.9** | **34.4** | **91.3** | **7.2** | **46.8** |
| | | | | | | | | | | |
| Existing On-Site Emissions (Verboom Dairy Farm) | | | | | | | | | | -22.4 |
| | | | | | | | | | | |
| **Net Emissions** | **1,272** | **213** | **835** | **56** | **468** | **108.9** | **34.4** | **91.3** | **7.2** | **24.4** |
| Significance Threshold (AQIA triggers) | 550 | -- | 250 | 250 | 100 | 100 | -- | 40 | 40 | 15 |
| Potentially Significant | yes | -- | yes | no | yes | no | -- | yes | no | yes |
| | | | | | | | | | | |
| Secondary Significance Threshold (offset triggers) | -- | -- | -- | -- | -- | -- | 50 | 50 | -- | -- |
| Significant | -- | -- | -- | -- | -- | -- | no | yes | -- | -- |

[a] Includes exhaust emissions from both on- and off-site haul trucks. If off-site transport of rock does occur, on-road regional vehicle exhaust emissions would increase by 5.8, 0.5, 4.1, and 0.2 tons per year of CO, ROC, $NO_x$, and $PM_{10}$, respectively. Exhaust emissions from daily activity would not change since the estimated emissions are based on the budgeted traffic forecast of 625 waste truck trips plus 50 other tuck trips per day. Fugitive dust emissions would be expected to be similar since the material would be hauled on-site regardless.

CO = carbon monoxide; VOC = volatile organic compounds; $NO_X$ = nitrogen oxides; $SO_X$ = sulfur oxides; $PM_{10}$ = particulate matter of ≤10 microns.

*Source: PCR Services Corporation, June 2002*

**TABLE 4.7-11**
**SUMMARY OF OPERATIONAL EMISSIONS (YEAR 30)**

| | (LBS/DAY) | | | | | (TONS/YEAR) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **EMISSION SOURCES** | **CO** | **VOC** | **$NO_X$** | **$SO_X$** | **$PM_{10}$** | **CO** | **VOC** | **$NO_X$** | **$SO_X$** | **$PM_{10}$** |
| | | | | | | | | | | |
| Equipment Exhaust | 123 | 21 | 190 | 3 | 1 | 18.9 | 3.3 | 29.1 | | |
| Vehicle Exhaust[a] | 312 | 21 | 101 | N/A | 3 | 28.7 | 1.9 | 8.6 | N/A | 0.3 |
| Fugitive Dust—Cover Operations | | | | | 26 | | | | | 1.9 |
| Fugitive Dust—Wind Erosion from Stockpiles | | | | | 10 | | | | | 1.8 |
| Vehicle Travel on Unpaved Roads | | | | | 4 | | | | | 0.4 |
| Vehicle Travel on Paved Road | | | | | 78 | | | | | 7.9 |
| Flare and Landfill Emissions | 188 | 207 | 144 | 42 | 58 | 34.3 | 37.8 | 26.3 | 7.7 | 10.5 |
| **Subtotal** | **623** | **250** | **435** | **46** | **180** | **81.9** | **43.0** | **64.1** | **8.3** | **23.0** |
| | | | | | | | | | | |
| Existing Onsite Emissions (Verboom Dairy Farm) | | | | | | | | | | -22.4 |
| | | | | | | | | | | |
| **Net Emissions** | **623** | **250** | **435** | **46** | **180** | **81.9** | **43** | **64.1** | **8.3** | **0.6** |
| Significance Threshold (AQIA triggers) | 550 | -- | 250 | 250 | 100 | 100 | -- | 40 | 40 | 15 |
| Potentially Significant | yes | -- | yes | no | yes | no | -- | yes | no | no |
| | | | | | | | | | | |
| Secondary Significance Threshold (offset triggers) | -- | -- | -- | -- | -- | -- | 50 | 50 | -- | -- |
| Significant | -- | -- | -- | -- | -- | -- | no | yes | -- | -- |

CO = carbon monoxide; VOC = volatile organic compounds; $NO_X$ = nitrogen oxides; $SO_X$ = sulfur oxides; $PM_{10}$ = particulate matter of ≤10 microns.
[a] Includes exhaust emissions from both on- and off-site haul trucks.
*Source: PCR Services Corporation, June 2002*

the project would contribute incrementally to regional ozone and would therefore, result in a significant air quality impact.

As shown in Table 4.7-12 and 4.7-13, worst-case daily operational $PM_{10}$ emissions have the potential to increase the number of exceedances of the more stringent State standard of 50 µg/m$^3$, but would not exceed the national standard of 150 µg/m$^3$ and would have a maximum off-site impact of 93 and 78 µg/m$^3$ in years 19 and 30 of operation, respectively. The maximum impacted off-site receptor in year 19 would be located east of the landfill footprint and in year 30 would be located directly northeast of the ancillary facilities in which no exposed individuals would be located in either direction for a duration of 24-hours.

**TABLE 4.7-12**
**OPERATIONAL IMPACTS ON AMBIENT POLLUTANT CONCENTRATIONS (YEAR 19)**

| | **CO** | | **$NO_2$** | | **Off-site $PM_{10}$ [a]** | **Closest Residence $PM_{10}$ [a]** |
|---|---|---|---|---|---|---|
| | **1-hour (PPM)** | **8-hour (PPM)** | **1-hour (PPM)** | **Annual (PPM)** | **24-hr (µg/m$^3$)** | **24-hr (µg/m$^3$)** |
| Project Impacts | 6.2 | 0.8 | 0.11 | 0.001 | 28 | 23 |
| Ambient (Escondido Monitoring Station ’96-’00) | 11.2 | 7.1 | 0.12 | 0.023 | 65 | 65 |
| Total | 17.4 | 7.9 | 0.23 | 0.033 | 93 | 88 |
| Most Stringent AAQS | 20 | 9 | 0.25 | 0.053 | 50 | 50 |
| Significant | No | No | No | No | Yes | Yes |
| | | | | | | |

[a] Impact is based on the 99-percent maximum daily concentration, per AAQS.
*Source: PCR Services Corporation, June 2002*

**TABLE 4.7-13**
**OPERATIONAL IMPACTS ON AMBIENT POLLUTANT CONCENTRATIONS (YEAR 30)**

| | **CO** | | **$NO_2$** | | **Off-site $PM_{10\ a}$** | **Closest Residence $PM_{10}$ [a]** |
|---|---|---|---|---|---|---|
| | **1-hour (PPM)** | **8-hour (PPM)** | **1-hour (PPM)** | **Annual (PPM)** | **24-hr (µg/m$^3$)** | **24-hr (µg/m$^3$)** |
| Project Impacts | 0.4 | 0.1 | 0.02 | 0.001 | 13 | 6 |
| Ambient (Escondido Monitoring Station ’96-’00) | 11.2 | 7.1 | 0.12 | 0.023 | 65 | 65 |
| Total | 11.6 | 7.2 | 0.14 | 0.024 | 78 | 71 |
| Most Stringent AAQS | 20 | 9 | 0.25 | 0.053 | 50 | 50 |
| Significant | No | No | No | No | Yes | Yes |
| | | | | | | |

[a] Impact is based on the 99-percent maximum daily concentration, per AAQS.
*Source: PCR Services Corporation, June 2002*

The maximum impacted residence would be located directly south of the landfill footprint and would have a maximum impact of 88 and 71 $\mu$g/m$^3$ in years 19 and 30 of operation, respectively. Concentrations of $PM_{10}$ are directly related to the distance from the emissions source, and therefore, modeled impacts to residences further away from the project site were substantially less than impacts identified for this maximum impacted residence.

A detailed analysis of the worst-case modeled year was conducted to further quantify the number of project related exceedances of the State standard. An annual profile was developed which shows the 24-hour concentration for each day of the year by receptor. Therefore, to determine the number of days that the project area would exceed the State standard this analysis looked at the number of days that project related emissions would incrementally add to background ambient concentrations and cause additional exceedances of the State standard. The results of this analysis are presented in Table 4.7-14 and show that the proposed project could cause 72 additional exceedances of the State 24-hour standard at the maximum off-site receptor and 27 additional exceedances of the State 24-hour standard at the maximum impacted residence for Year 19, in addition to the average 12 days per year that already occur in the project area without the project. For year 30 of operation, the proposed project could potentially cause 14 additional exceedances of the State 24-hour standard at the maximum off-site receptor and no additional exceedances of the State 24-hour standard at the maximum impacted residence. Therefore, the project would result in a significant air quality impact since project-related emissions of $PM_{10}$ have the potential to cause additional violations of the California Ambient Air Quality Standard for $PM_{10}$.

**TABLE 4.7-14**
**$PM_{10}$ YEARS 19 AND 30 OPERATIONAL IMPACTS**
**(NUMBER OF ADDITIONAL EXCEEDANCES OF THE STATE 24-HR $PM_{10}$ STANDARD)**

| | Year 19 Off-site Impact (days per year) | Year 19 Impacted Residence (days per year) | Year 30 Off-site Impact (days per year) | Year 30 Impacted Residence (days per year) |
|---|---|---|---|---|
| Background Ambient (>40 $\mu g/m^3$)[1] | 33 | 33 | 33 | 33 |
| Project Impact (>10 $\mu g/m^3$) | 72 | 27 | 14 | 0 |
| **# of Exceedances of State Standard (>50 $\mu g/m^3$)** | **33** | **27** | **14** | **0** |
| | | | | |
| Background Ambient (>30 $\mu g/m^3$)[1] | 119 | 119 | 119 | 119 |
| Project Impact (>20 $\mu g/m^3$) | 13 | 8 | 0 | 0 |
| **# of Exceedances of State Standard (>50 $\mu g/m^3$)** | **13** | **8** | **0** | **0** |
| | | | | |
| **Maximum # of Exceedances of State Standard** | **33** | **27** | **14** | **0** |

[1] Background ambient concentrations of $PM_{10}$ are based on the closest and most representative SDAPCD air quality monitoring station in Escondido.
*Source: PCR Services Corporation, June 2002*

These estimates are based on conservative estimates of periodic construction and maximum operational activity which include a maximum daily landfill delivery rate of 5,000 tons per day. However, based on the maximum allowable accepted landfill waste per year, the average waste delivery would be 3,200 tons per day. Therefore, actual impacts would be expected to be much lower since worst-case daily emissions presented in Tables 4.7-10 and 4.7-11 would not occur every day over the entire year. Please see Appendix K for a detailed discussion of the analysis.

Table 4.7-15 presents the summary of significance for the project operation. As presented in this table, emissions of CO, VOC, and $SO_X$, are not significant, while emissions of $NO_X$, and $PM_{10}$ are concluded to pose potential significant air quality impacts.

**TABLE 4.7-15**
**SUMMARY OF IMPACTS RELATED TO PROJECT OPERATION**

| Pollutant | Significant | Reason |
|---|---|---|
| CO | no | Project related emissions do not cause an exceedance of any AAQS. |
| VOC | no | Below SDAPCD Rule 20 offset requirements[a] |
| $NO_x$ | yes | Above SDAPCD Rule 20 offset requirements[a] |
| $PM_{10}$ | yes | Has the potential to cause additional violations of the CAAQS. |
| $SO_x$ | no | Does not exceed the relative AQIA trigger level |

[a] Mobile source emissions were included for purposes of CEQA evaluation. However, SDACPD Rule 20 offset requirements are typically only for permitted sources (i.e., fugitive emissions from the landfill surface and landfill flare) and will be re-evaluated during the permitting process.
*Source: PCR Services Corporation, June 2002*

Potential Impacts to Avocados and Citrus from Dust and Particulate Matter

San Diego County's semi-arid climate is one in which both avocados and citrus thrive. Additional avocado and citrus crops are raised throughout Southern California, including areas in the South Coast Air Quality Management District where dust and particulate matter routinely exceed both the State and Federal standards for acceptable air quality.

The area around the project site currently meets the Federal particulate standard, and operations at the landfill are not expected to cause the ambient levels of particulate matter to exceed this standard. A search of the California Air Resources Board (ARB) Five Year Reports on Air Pollution Damage to California Crops published in 1985, 1990 and 1995 did not list avocados or citrus as a crop damaged by dust.

In summary, the avocado and citrus industry thrives in hot dry climates, including routine exposure to hot, dry, and dusty Santa Ana winds. Dust and particulate matter have not been identified as a major impact to avocado or citrus trees, blossoms or pollination. Additionally, the tough outer skin of both the avocado and citrus fruit would seem to be very resistant to dust.

Potential for Microclimate Changes

The area on site occupied by the landfill (approximately 309 acres) will be partly modified into a small basin or depression, thereby possibly altering the drainage of cold air down the existing slopes of the canyon.

While a small pocket of cold air could be trapped in this depression, it would be localized to the bottom of the landfill footprint where there is no mechanism for this cold air to spill over or affect adjacent areas. Potential adverse effects would be limited by the small size of the landfill basin, as compared to the much larger floor area (12,000 acres) of the entire canyon. An assessment of the potential change suggests a less than a one degree Fahrenheit temperature drop could occur in the landfill footprint area. This is not a significant temperature change.

With respect to the frost hardness of agricultural crops, especially avocados, the surrounding area routinely sees occurrences of temperatures dipping below 32 degrees Fahrenheit. As noted above, microclimate effects will be limited to the landfill itself, and should pose no danger to the surrounding agricultural uses.

### 4.7.3.3 Long-Term Off-Site Operational Impacts

Regional Impacts from Waste Hauling

Trucks hauling solid waste to the landfill and trucks transporting brine, leachate, and excess aggregate off-site would contribute air pollutants to the regional air basin. However, the regional emissions from waste hauling to the Gregory Canyon Landfill would likely decrease relative to the emissions resulting from current waste hauling practices, because of the proposed facility's closer proximity to waste generators in North County. As discussed in the No Project Alternative, in 1999, approximately 3,283,362 tons of Class III solid waste were generated within the County of San Diego.[3] Of this, approximately 799,466 tons, or 24 percent, of solid waste were generated by jurisdictions in North County. Approximately 15 percent of the County's solid waste disposed of via direct haul or transfer stations was transported to out-of-County landfills, while 27 percent of the solid waste generated within North County disposed of at out-of-County facilities.[4] The 1999 disposal patterns resulted in approximately 15,135,704 vehicle miles traveled (VMT) for the County of San Diego as a whole and 4,304,455 VMT for North County jurisdictions.

The growth projections for the North San Diego County area indicate that regional solid waste generation will increase. It is anticipated that waste will continue to be transported outside the County or to landfills in the City of San Diego (Sycamore Canyon, Miramar) or South County (Otay) until the proposed project or another North County landfill is developed. The proposed Gregory Canyon Landfill is geographically situated to provide regional waste disposal for northern San Diego County. This would reduce the length of waste transport trips from northern San Diego County jurisdictions. (Please see Section 6.2.1, No Project Alternative, of this EIR.)

Local Impacts from Waste Hauling

An analysis of CO concentrations at three locations in the project vicinity was conducted because the project would increase traffic on the roadways serving the project area. Future CO concentrations with the project were estimated with the CALINE4 computer model. The purpose of this modeling was to determine microscale impacts adjacent to the roadways that would be most affected by the proposed project for the full buildout year (2020). Simulations were performed for both the *future no project* and *future with project* scenarios in order to demonstrate the incremental effect of project emissions as accurately as possible. The *future with project* scenarios took into account cumulative traffic volumes to assess the impact of project traffic in conjunction with traffic generated by nearby planned projects. The specific locations evaluated were the intersection of the SR 76 and the I-15 northbound and southbound ramps and the intersection of the SR 76 and the proposed project access road. Eight receptors were placed near each of the three intersections and were located 10 and 23 feet from the roadways, consistent with guidance provided in the Transportation Project-Level Carbon Monoxide Protocol (Institute of Transportation Studies, 1997).

CALINE4 was used to conduct the microscale dispersion modeling and calculate a CO 1-hr concentration. CALINE4 represents roadways as a series of straight-line segments called links.

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3 Based on data provided by the San Diego Department of Health in 2000 (refer to Appendix R of this EIR).

4 North County jurisdictions rely heavily on transfer stations with approximately 71 percent of the North County waste disposed of via use of transfer stations in 1999 compared with 35 percent Countywide.

Site geometry of the intersections such as the number of traveling lanes and lane width was obtained from the traffic study performed by Darnell & Associates (see Appendix I and Section 4.5, Traffic and Circulation of this Final EIR). Meteorology used for the CALINE4 model simulations included strongly stable conditions (Stability Class G), a wind speed of 0.5 meter per second (1 mph), low wind direction variability (sigma theta = 10 degrees), and a temperature of 60 degrees Fahrenheit (15.6 degrees Celsius). Surface roughness assumed for the project area was 321 cm. The CALINE4 option to search for the worst wind angle was used with a surface roughness of 321 cm.

The contribution of the project to the 1-hour CO concentration was obtained, and subsequently, added to the background concentration. The 8-hour CO concentration was then estimated by applying the appropriate persistence factor to the total 1-hour CO concentration. Finally, the 8-hour CO concentration was compared with the 8-hour CO standard.

The CALINE4 2020 model simulations for the *future no project* and *future with project* scenarios used A.M. and P.M. peak-hour traffic volumes at the critical intersections as determined by Darnell & Associates (2001) (see Appendix I and Section 4.5, Traffic and Circulation).

Future background CO levels were projected using CARB's MVEI7G to determine the ratio of future CO emissions to existing CO emissions. This ratio was multiplied by the existing one-hour background concentration which was obtained from the Escondido monitoring station using the highest one-hour measurement over the last three years of available data (6.2 ppm for the one-hour CO level, and 3.2 ppm for the eight-hour CO level).

The results of the CALINE4 CO modeling are summarized in Table 4.7-16 for the projected future one-hour and eight-hour CO concentration levels in year 2020.

**TABLE 4.7-16**
**WORST-CASE PROJECTIONS OF PEAK-HOUR CARBON MONOXIDE CONCENTRATIONS**
**YEAR 2020**

| | | **ESTIMATED FUTURE CO CONCENTRATIONS [a]** | | | |
|---|---|---|---|---|---|
| **RECEPTOR** | | **NO PROJECT** | | **WITH PROJECT** | |
| **LOCATION NO.** | **LINK** | **1 HOUR (ppm)** | **8 HOUR (ppm)** | **1 HOUR (ppm)** | **8 HOUR (ppm)** |
| 1 | SR 76/I-15 northbound ramp | 7.2 | 3.6 | 7.3 | 3.7 |
| 2 | SR 76/access road | 6.9 | 3.4 | 7.1 | 3.6 |
| 3 | SR 76/I-15 southbound ramp | 8.6 | 4.2 | 8.9 | 4.5 |
| | Federal standard | 35 ppm | 9 ppm | 35 ppm | 9 ppm |
| | State standard | 20 ppm | 9 ppm | 20 ppm | 9 ppm |
| | **Exceedances** | **none** | **none** | **none** | **none** |

[a] CO concentrations shown above include the maximum background CO levels of 6.2 ppm for the one-hour level, and 3.2 ppm for the eight-hour level.
NB = northbound
*Source: Table 4.7-1 and PCR Services Corporation, June 2002*

The future one-hour and eight-hour CO levels for both scenarios are projected to comply with the one-hour and eight-hour CO California and federal standards at all three locations. Therefore, the proposed project would not create a significant air quality impact. Comparison of the CO concentration levels for the *future with project* scenario (Table 4.7-16) with the existing CO concentrations (Table 4.7-4) shows that future maximum CO levels would be lower at the modeled intersections. *Future with project* CO concentrations are predicted to decrease from existing conditions because the decrease in background CO concentration is larger than the increase in CO levels due to future traffic conditions.

The *future with project* scenario is projected to slightly increase one-hour and eight-hour CO concentrations over the *future without project* scenario. A comparison of one-hour CO concentrations presented in Table 4.7-16 shows an increase in CO of 0.1 ppm, 0.2 ppm, and, 0.3 ppm for SR 76/I-15 northbound, the SR 76/access road intersection, and for SR 76/I-15 southbound, respectively. The maximum eight-hour CO levels are also projected to increase by 0.1 ppm, 0.2 ppm, and, 0.3 ppm for SR 76/I-15 northbound, the SR 76/access road intersection, and for SR 76/I-15 southbound, respectively.

<u>Potential Visibility Impacts in the Agua Tibia Wilderness Area</u>

A screening analysis was performed by PCR to evaluate the potential for plume visibility at the Agua Tibia Wilderness Area due to pollutant emissions from the proposed project. Class I areas such as national parks and wilderness areas are afforded special visibility protection designed to prevent such plume visual impacts to observers within a Class I area.

Specifically, EPA's VISCREEN model was applied to assess the potential for the proposed project's emissions to create a visible plume within or adjacent to the Agua Tibia Wilderness Area. The model calculates two parameters of an emission plume that govern its visibility: (1) the plume's capacity to scatter and absorb sufficient light so that the plume is darker or lighter than its viewing background; and (2) the amount of color contrast between the plume and its viewing background. These parameters are calculated for both sky and terrain viewing backgrounds.

The visibility screening analysis used projected maximum daily emission rates of $PM_{10}$ and $NO_x$ from the proposed project of 468 lbs/day and 835 lbs/day, respectively. These maximum daily emissions are projected to occur in year 19 of operation due to concurrent periodic construction and project operation. Default values were used for background air pollutant concentrations. A wind speed of 2.18 m/s and a stability class of D ("daytime" or "neutral") was input based on annual data from the Miramar Air Station for 1995. The assumed values for required input parameters to the VISCREEN model are shown in Table 4.7-17.

The specific plume parameters that are estimated by the VISCREEN model include the color difference parameter (Delta-E) and the plume contrast for three different light wavelengths (0.4, 0.55, and 0.7 millimeters [mm]) against a sky and terrain viewing background. Effects on atmospheric discoloration or contrast can arise from the scattering and absorption of light by the particulate matter in the plume in question and the absorption by the plume $NO_X$. The "Delta-E parameter" is a measure of color and brightness changes that results from the presence of a pollutant plume, while the "plume contrast parameter" is an indication as to whether the plume would appear darker or lighter than the background. The screening criteria for these parameters are >2.0 for Delta-E and >0.05 for the green contrast. Predicted Delta-E and contrast results in excess of these values for different assumed lines of sight relative to the plume's trajectory indicate that it may be visible/perceptible at the selected vantage point.

**TABLE 4.7-17**
**VISCREEN MODEL INPUT PARAMETERS**

| PARAMETER | VALUE |
|---|---|
| Estimated Emissions | |
| Particulate Matter | 468 lbs/day |
| Oxides of Nitrogen | 835 lbs/day |
| Primary Sulfate | 0 lb/day |
| **Background Pollutant Levels** | |
| Ozone | 0.04 ppm |
| Visual Range | 50 kilometers |
| Particle Characteristics | Plume Particle Size Class = 8 (USEPA Default, Aggregate Handling), all other values are the default values in VISCREEN |
| **Source-Receptor Distance** | |
| Minimum distance to Class I Area | 9.2 kilometers from Project Site to Agua Tibia |
| **Class I Area** | |
| Plume/Source Observation Angle | 11.25 degrees |
| **Meteorological Conditions** | |
| Stability | D, daytime “neutral” |
| Wind Speed | 2.18 meters per second |
| *Source: PCR Services Corporation, June 2002* | |

The vantage point assumed was the nearest point of the Agua Tibia Wilderness boundary facing the project site boundary. This point is about nine kilometers northeast of the project site. If the effects of the project’s emissions on plume color differential and light extinction/contrast are predicted by the model to be below the screening level criteria specified in the VISCREEN users manual, no further analysis of the project’s visibility impacts at the selected vantage point is warranted. If the screening criteria are exceeded, then a second tier plume visibility analysis using a more complex model is generally required.

The VISCREEN model performs four tests for the selected vantage point. The first two tests are for within-area views and refer to visual impacts caused by plume parcels located inside the boundaries of the Class I area. The last two tests are performed in order to assure protection of integral vistas and refer to plume parcels located outside the boundaries of the Class I area. An integral vista is a view from a location inside a Class I area of landscape features located outside the boundaries of the Class I area.

For this analysis, the VISCREEN model calculated plume perceptibility for 34 lines of sight (LOS) for both inside and outside views. The LOS span from one degree to 160 degrees in each direction, relative to the line connecting the observer and the source. The angle between one possible LOS and the line connecting the observer and the source is shown as $\phi$ (phi) in Exhibit 3, in Appendix E-1 of the Air Quality Technical Report. Exhibit 3 also depicts the geometry of the plume, the distance from the emission source to the observer, and the nearest and most distant Class I area boundaries. Model results are provided for two assumed worst-case sun angles. The “forward scatter” case refers to a situation in which the sun is in front of the observer such that the scattering angle (the vertical angle relative to the horizon) is 10 degrees. Such a sun angle will tend to maximize the light scattered by plume particulates and maximize the brightness of the plume. In reality, such a sun angle may or may not occur during worst-case conditions for the given LOS. The "backward scatter" case refers to a situation in which the sun is behind the observer such that the scattering angle is 140 degrees. A plume is likely to appear the darkest with such a sun angle.

The maximum calculated Delta-E and plume contrast values are shown in Table 4.7-18. Asterisks denote values that exceed the screening criteria. Delta-E and plume contrast values for all lines of sight are included in Appendix E-1. The results in Table 4.7-18 indicate that maximum project emissions would not create a visible plume at the closest vantage point within the Agua Tibia Wilderness Area. One LOS shows an exceedance of the screening criteria, however, this LOS is physically unrealistic. As indicated in Appendix E-1 of the Air Quality Technical Report, the angle $\phi$ equals 1.4 degrees for this LOS. If the observer is looking outside of the Agua Tibia Wilderness Area at a 1.4 degree angle relative to the line connecting the observer and the source, the 10 degree forward scatter and the 140 degree backward scatter of the sun are not possible at any time during the year. Therefore, it is determined that the emissions from the project will not cause significant plume visibility impacts to the Agua Tibia Wilderness Area because screening decisions are based only on the worst case impacts associated with realistic geometries (EPA's Workbook for Plume Visual Impact Screening and Analysis, revised October 1992). A VISCREEN analysis was also performed for project emissions projected to occur in year 30 of operation. The results of this analysis are included in Appendix E-1 of the Air Quality Technical Report. The results indicate that emissions from the project occurring in year 30 of operation would not create a plume visible to an observer at the selected vantage point.

**TABLE 4.7-18**
**RESULTS OF VISCREEN MODEL SCREENING ANALYSIS**
**GREGORY CANYON LANDFILL/AGUA TIBIA WILDERNESS AREA**

| | | ESTIMATED MAXIMUM VISUAL IMPACT ON AGUA TIBIA WILDERNESS AREA | | | |
|---|---|---|---|---|---|
| | | DELTA-E | | PLUME CONTRAST | |
| BACKGROUND | SCATTERING | SCREENING CRITERIA | PLUME | SCREENING CRITERIA | PLUME |
| **Inside of Wilderness Area** | | | | | |
| Sky | Forward | 2.0 | 0.4 | 0.05 | -0.001 |
| Sky | Backward | 2.0 | 0.2 | 0.05 | -0.003 |
| Terrain | Forward | 2.0 | 0.3 | 0.05 | 0.003 |
| Terrain | Backward | 2.0 | 0.1 | 0.05 | 0.002 |
| **Outside of Wilderness Area** | | | | | |
| Sky | Forward | 2.0 | 2.5[a] | 0.05 | -0.004 |
| Sky | Backward | 2.0 | 0.9 | 0.05 | -0.017 |
| Terrain | Forward | 2.0 | 1.9 | 0.05 | 0.017 |
| Terrain | Backward | 2.0 | 0.7 | 0.05 | 0.011 |

[a] Exceeds Screening Criteria

Note: A positive or negative value for plume contrast indicates that the plume is either brighter or darker than the viewing background.

*Source: PCR Services Corporation, June 2002*

Along most points of common public access, potential marginal visibility of any landfill emissions plume would be less than significant because the Agua Tibia Wilderness Area is screened from view by intervening terrain. Topographic cross-sections from various viewing angles show the wilderness to be mainly blocked by terrain. Only the top of Agua Tibia Mountain is visible from most locations.

Representative terrain cross-sections were constructed from three vantage points. Along I-15 across Rainbow Valley, and from the Palomar Lookout, views of the mountain and wilderness area are fully obstructed. From a few locations along SR 76, where the river valley broadens, the top few hundred feet of the mountain are visible. However, surface-based emissions would blow around the top of the mountain, and not over the crest. Any off-site views would thus be negligible.

Visibility impacts are therefore considered less than significant because 1) the visibility threshold criteria are not exceeded at points within the Wilderness Area, and 2) views of the wilderness area from public roads (I-15, SR 76, and County Roads S6 and S7) are partially or fully obstructed such that the visual quality of the wilderness would not be impaired.

### Odor Impacts

Although odors are generally regarded as an annoyance rather than a hazard to health, not all odors should be considered as simply an annoyance. Manifestations of a person's reaction to foul odors can range from the psychological (i.e., irritation, anger, or a simple unease) to the physiological, including circulatory and respiratory effects, nausea, vomiting, and headache.

The science of predicting the potential for odors to adversely affect residential populations is relatively new and odor assessment is very complex. With the information currently available, it is not possible to precisely predict community reaction to an odor. Given the variables involved in such a prediction, it may never be possible to predict community reaction.

The human nose, which is notoriously undependable, is the sole odor-sensing device of any quality. The ability to detect odors varies considerably among the population. Some individuals have the ability to smell very minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor. An odor that is offensive to one person may be perfectly acceptable to another person. In addition, unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. Furthermore, a phenomenon known as odor fatigue exists, under which a person can become desensitized to almost any odor and be conscious of it only when a change in intensity occurs.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if we describe an odor as flowery or sweet, we are describing the quality of the odor. Intensity refers to the strength of the odor. For instance, when an odor is described as strong, we are describing the intensity of the odor.

Odor intensity depends in a complex way on the odorant substance's concentration in an air sample. When an odorous sample is progressively diluted, the concentration of odorants decreases. As this occurs, the odor intensity weakens and eventually becomes so low (as the result of the progressive dilution) that detection or recognition of the odor is very difficult. At some point of dilution, the concentration of the odorant reaches the "detection threshold." An odorant concentration below the detection threshold means that the odor is not detectable because there is not enough of the substance in the air sample to be detected by the average human.

Odor Generation

The odors generated by solid waste are attributable to both the inherent odor of the material and to odors generated by decomposition. The decomposition of waste can be either aerobic (presence of oxygen) or anaerobic (absence of oxygen). Odors generated by each of these mechanisms are discussed below.

*Inherent Odors*

Inherent odors are the odors a material has when new or fresh. For example, an apple when fresh has an inherent odor familiar to everyone. If the apple is allowed to rot, new odors become evident as a result of the decomposition process.

The inherent odors of solid waste are dependent upon the materials that comprise the waste stream. The proposed project would handle both commercial/industrial wastes and residential wastes. Commercial wastes consist primarily of paper products, metal and plastics. These materials have a very low inherent odor generation potential. Of the materials found in residential solid waste, food and yard wastes have the highest inherent odor characteristics.

*Odors Generated by Aerobic Decomposition*

As decomposition of organic material progresses, gases are produced, many of which are odorous. Aerobic decomposition indicates bacterial and other action taking place in the presence of oxygen. In the aerobic cycle, organic matter (composed primarily of carbon, hydrogen, and oxygen) is digested with oxygen by a microorganism, producing carbon dioxide and water. Aerobic decomposition produces gases that are less odorous than anaerobic decomposition.

Under aerobic decomposition, organics containing sulfur will be converted to sulfur dioxide. Similarly, compounds containing nitrogen will be converted to some form of oxide of nitrogen. The majority of by-products of aerobic decomposition, that is carbon dioxide, water, and oxides of nitrogen, are odorless. However, sulfur oxides have a slight odor described as "sulfidy and pungent." Sulfur dioxide's odor threshold is 0.47 ppm. Additional odors may be generated by partially decomposed organic material that volatilizes or evaporates.

*Odors Generated by Anaerobic Decomposition*

Anaerobic decomposition of waste material occurs under conditions where there is a lack of free oxygen molecules. This type of condition occurs once the waste material is buried in the landfill. Although the buried organic material would initially undergo aerobic decomposition (because oxygen is present with the waste material), the oxygen supply in the waste would be depleted after a short time. This oxygen depletion halts aerobic decomposition of the material and creates conditions suitable for anaerobic decomposition. Compacted solid waste will decompose anaerobically because most of the air is mechanically forced from the waste. Waste in the center of a solid waste (or compost) pile is also likely to decompose anaerobically because the oxygen is used up during the initial aerobic decay process. Landfills are probably the largest common example of a set of conditions highly conducive to anaerobic decomposition. The anaerobic process converts organic matter to methane and carbon dioxide. Anaerobic decomposition produces gases that are considerably more odorous than aerobic decomposition.

In the anaerobic process, nitrogen contained in the organic waste will be converted to ammonia, which has an odor threshold of 46.8 ppm. Ammonia does not have a particularly low odor threshold and is not a primary concern in odor potential assessment (the lower the threshold of a substance, the more easily its odor is noticed). The sulfur in the organic waste will be converted to hydrogen sulfide, which has a pungent odor often described as being similar to rotten eggs. It also has a low odor threshold of 0.00047 ppm. Comparing this odor threshold to that of the sulfur dioxide generated by aerobic decomposition (0.47 ppm) reveals why the anaerobic process generates substantially more odors. The threshold concentration for sulfur dioxide is 1,000 times higher than hydrogen sulfide.

Potential Odor Impacts

Buried solid waste generates methane, carbon dioxide, and other trace gases, some of which have strong odors. There are three primary control mechanisms incorporated into the project to control landfill gas: 1) minimize the size of the working face, 2) application of daily and intermediate cover, and 3) installation of the landfill gas system.

In addition, potential odor problems could occur when the fill surface, due to differential settlement or subsidence, cracks and allows the landfill gases to escape into the atmosphere. As part of the project operation, any cracks found in the surface of the landfill would be filled.

In addition to minimizing the working face, and the use of cover, the gas collection system, which is proposed as part of the project, would eliminate most of the gas released into the atmosphere. The gas collection system would consist of a series of collection wells interconnected by aboveground laterals (pipes) and a main header pipe connected to a flare station. A slight vacuum would be placed on the piping, which would draw the landfill gas out of the decomposing solid waste and into the piping. The collected gas would be burned, and the odors destroyed in the combustion process. The gas collection system, including additional collection wells and flares, would be expanded as the landfill is developed to provide ongoing control within the performance criteria established and mandated by the SDAPCD and state and federal regulations.

A literature review of landfill gas and odors provides a mechanism for both a qualitative and semi-quantitative evaluation of the potential for odors at the site boundary. Landfill gas consists primarily of methane and carbon dioxide, and has trace amounts of organic compounds. Some of these organic compounds, such as mercaptans and sulfides, contain sulfur and are known to have easily detectable odors. Each sulfur compound has a minimum detectable concentration, below which no odor can be discerned.

EPA has extensively studied landfill gas compositions throughout the United Sates. Typical values for methane and total sulfur compounds are shown below:

| | |
|---|---|
| Methane | (50 percent) = 500,000 ppm |
| Sulfur compounds | 50 ppm |

The ratio of sulfur compounds to methane is one to 10,000.

EPA has also studied the concentrations of methane which occur at the surface of landfills. EPA monitoring has shown these methane concentrations range between one and 20 ppm. Assuming the highest concentration for surface level methane occurs at the proposed landfill, the resulting concentration of all sulfur compounds released to the atmosphere would be 2 ppb. The noticeable odor threshold for sulfur compounds are hydrogen sulfide 200 ppb and mercaptans 27 ppb. Thus, the maximum concentration of any sulfur compound having an odor will remain at least one order of magnitude (ten-fold) lower than the detectable limit by the human nose.

### 4.7.3.5 Air Toxics Health Risk Assessment

Assessment Approach

The air toxics HRA was conducted in accordance with the technical procedures specified in the SDAPCD document entitled, "Guidelines for Preparing Health Risk Assessments in Accordance with the Requirements of Assembly Bill 2588" (SDAPCD 1997), and the CAPCOA Risk Assessment Guidelines (CAPCOA, 1992). It is similar in methodology to the HRA that must accompany the Authority to Construct application to SDAPCD for the Gregory Canyon landfill pursuant to the requirements of District Rule 1200, but it includes on-road and fugitive sources not normally included in risk assessments accompanying permit applications. This HRA, because it is for use in support of this EIR, includes all stationary, mobile, and fugitive sources associated with the project.

The principal elements of this HRA, which are addressed in separate subsections below, are as follows:

- Project-related TAC emissions from all project sources (landfill gas, dust, and equipment/ vehicle exhaust);
- Air dispersion modeling in support of risk assessment;
- Risk assessment quantification (incremental cancer risk and acute and chronic non-cancer health risks); and
- Cancer burden.

Project-Related TAC Emissions

The principal sources for TAC emissions from the proposed project include:

- Fugitive landfill gas and flare emissions;
- dust-related emissions due to wind erosion, waste placement and covering, earth-moving operations, rock crushing and tire shredding, and vehicle travel on paved and unpaved roads; and
- exhaust from in and out-bound waste trucks, landfill equipment, and other onsite vehicles.

To satisfy the HRA requirement in SDAPCD Rule 1200 for evaluation of carcinogenic, acute and chronic impacts, the emission quantification task emphasized the estimation of maximum one-hour and annual average emissions for all TAC emission sources associated with the proposed landfill. By the nature of landfill operations, the locations of the equipment and other sources of TACs, except the flare, would change over the operational lifetime of the landfill, as would the magnitudes of the associated emissions. This variability requires that TAC emission scenarios be carefully selected to ensure that conditions indicative of the maximum project emissions are addressed. SDAPCD Rule 1200 requires that a risk assessment in support of an Authority to Construct be based on the proposed project's maximum potential to emit. However, the maximum emission levels would not necessarily occur during the same time periods for all sources associated with the landfill or for all pollutants. Landfill gas generation would initially be very small, but would increase throughout the period over which waste is accepted; and thereafter it would decrease. The rise and fall of emissions from the flare would linearly track the gas generation rate. On the other hand, excavation activities, which cause the maximum dust and equipment exhaust emissions from the project, would occur during periodic construction that would occur during several years throughout the lifetime of the landfill.

Since these different source categories would generate different sets of toxic air pollutant emissions at different times and in different locations within the project area, risks from all project sources have been evaluated in the HRA for the following two operational years:

- Year 19 of Operation—The year with maximum periodic construction occurring
- Year 30 of Operation—The year with maximum landfill gas generation

TAC Emissions in Landfill Gas

Landfill gas emission rates of TACs for the proposed project were estimated using the guidance in Section 2.4, Municipal Solid Waste Landfills, from EPA's AP-42 document (EPA 1995) and District guidelines. First, the uncontrolled landfill methane generation rate was calculated for each year of the facility's lifetime based on the annual refuse acceptance rate. These calculations showed that gas production would reach its maximum in year 30 of facility operations and would decline steadily thereafter as receipt of waste would be discontinued. The highest predicted methane gas generation rate in year 30 is 40.97 million cubic meters ($10^6$ $m^3$/yr).

SDAPCD and USEPA documents provide lists of toxic compounds that may be found in landfill gas and default concentrations for the individual constituents. EPA's AP-42 encourages the use of site-specific data over the default information when available. For this HRA, estimates of the emission rates of individual TACs are all based on SDAPCD provided default concentrations for landfill gas in San Diego County. Several studies have been conducted indicating that the default acrylonitrile concentrations provided in the USEPA AP-42 are overly conservative. The project will continue to coordinate with the SDAPCD to determine representative concentrations of acrylonitrile in San Diego landfills, such that the actual HRA performed in support of obtaining a Permit to Operate for the landfill gas collection system will utilize representative data. Although it has been shown by numerous studies that the default acrylonitrile concentrations provided in the USEPA are overly conservative, the default value of 6.33 ppmu was used as part of this analysis. [5]

It is assumed that all of the gas generated by the landfill is either collected by the gas collection system or finds its way to the atmosphere through cracks or other openings in the landfill surface; a gas collection efficiency of 80 percent was assumed. It is thus assumed that 20 percent of the generation rates for total landfill gas and of the individual toxic constituents would be emitted directly from the landfill surface. The remaining gas would be sent to the flare, where the assumed destruction efficiencies for this gas stream are 99.2 percent for non-methane organic compounds and 98 percent for halogenated organics (EPA AP-42). Calculated TAC emissions for landfill gas and flare emissions are provided in the Appendix A-2 of the Air Quality Technical Report.

Project TAC Emissions in Fugitive Dust and Equipment Exhaust

Sources of fugitive dust associated with operation of the proposed landfill and rock processing would include all the activities discussed in Section 4.7.3.2. It is assumed that toxic compounds contained within this dust would be emitted proportionately to their individual concentrations in the soils at the project site. It is expected that waste hauling and employee traffic, as well as landfill equipment activity, would be relatively constant over most of the facility's operational

[4] Patrick S. Sullivan, Michael S. Michels, The Time is Now For Changes to the AP-42 Section on Landfills (Uncited).

lifetime. Most of the variability in dust emissions would result from increased or decreased excavation and stockpiling activity during different phases of the project. Maximum dust emissions would occur in the years when the intensity of these periodic construction activities reaches maximum levels. Actual activity levels would most likely build slowly as the facility begins operation. Therefore, the assumptions used in developing the HRA are conservative.

The majority of the dust generation source categories would be related to the movement of on-site mobile equipment, i.e., truck and vehicle travel on paved and unpaved roads, operation of heavy construction and excavation equipment in the areas being prepared, rock crushing, as well as landfilling and at the operating face. These vehicles and equipment would also produce exhaust emissions of criteria and toxic air contaminants. Criteria pollutant emissions associated with this source category were presented in Section 4.7.2.1. The relative impacts of the project's exhaust-related emissions of TACs at different times during the lifetime of the operational landfill are expected to closely track those of the dust generation sources. The periods of maximum dust generation and equipment exhaust emissions correspond to the periodic construction activities occurring concurrently with waste handling activity. Maximum concurrent periodic construction and operational emissions occur during year 19 of facility operation.

For this HRA, emissions of potentially toxic constituent compounds in the dust generated from all project sources were estimated based on default concentrations of metals found in different particulate matter samples throughout San Diego County, as reported by the SDAPCD.

CARB and USEPA data regarding TAC emissions from heavy duty diesel engines was used to develop the TAC emissions from onsite mobile sources. The mobile source TAC emissions summary and related calculations are provided in the Appendices B-3 and C-4 of the Air Quality Technical Report. Worst case daily and annual criteria pollutant emissions from project sources were presented in Tables 4.7-10 and 4.7-11 respectively. These data were used as the basis for both the annual and maximum hourly TAC emission scenarios for the selected model simulation years. For the worst-case hour emission calculations all sources were assumed to be operating simultaneously. Tables showing the calculation of estimated annual and maximum hourly emission rates for toxic compounds that may appear in the exhaust of specific landfill equipment and vehicles and in the plumes of dust generating sources are provided in Appendices B-3 and C-4 of the Air Quality Technical Report. Emissions of TACs from the major categories of dust-generating and equipment exhaust sources associated with the operation of the landfill are also provided in Appendix K to this Final EIR.

Both fugitive dust generation and equipment exhaust emissions involve activities that can occur anywhere within specified portions of the project site. In addition, the mechanisms of pollutant release for these source categories cause emissions to be initially mixed over some depth, rather than confined to a flux across a surface like landfill gas emissions. Such activities are most accurately characterized as three-dimensional sources, and most dust and exhaust sources were represented as volume sources with initial vertical dispersion in the risk assessment modeling described in subsequent sections of this report. The initial vertical dispersion assumed for these volume sources was four meters (or about 13 feet). Dust emissions due to wind erosion, construction and landfill cover operations were modeled as volume sources.

Air Dispersion Modeling to Support Risk Assessment

Dispersion model simulations with the Industrial Source Complex Short-Term 3 model (ISCST3) were used to normalize pollutant concentration estimates due to emission sources at the proposed project landfill. This model was used because of its ability to simulate dispersion from multiple point, area and volume sources; its ability to account for the effects of terrain on plume transport and dispersion (for point sources). Use of ISCST3 is also consistent with APCD guidelines for the conduct of health risk assessments for compliance with the requirements of AB 2588 and the District's new source permitting requirements under Rule 1200.

Meteorological Inputs

The HRA is based on three years of records of hourly meteorological data collected at Miramar Naval Air Station. These data sets, which were compiled from concurrent surface and upper air measurements during 1993, 1994 and 1995, are recommended by the SDAPCD for modeling studies involving sources in non-coastal sites within San Diego County.

Emissions Inputs

The ISCST3 simulations for landfill gas impact and vehicle related TAC emissions were made with unit emission rates specified for each source (i.e., 1.0 gram per second for point and volume sources, 1.0 grams per second per square meter for area sources). Results of these analyses were then scaled using the CAPCOA ACE2588 Health Risk Assessment Model to determine the constituent concentrations. Most landfill operational sources, including waste hauling, landfill management, periodic construction, stockpiling and other equipment operation, would typically produce emissions over 10 to 11 hours, six days a week. (The landfill would operate 307 days per year.) Exceptions that would have the potential to cause continuous emissions around the clock on all days include landfill gas and flare emissions and wind erosion on exposed landfill and stockpile surfaces. The ISCST3 dispersion model allows the use of variable emissions for such sources. For the Gregory Canyon simulations, the time variable sources were assigned unit emissions for hours 0700 to 1700 of each day and zero emissions for the remaining 13 hours.

Receptor Inputs

A total of 2,631 receptors were modeled as presented in the Appendix K to this Final EIR. Receptor elevations were obtained directly from USGS 7.5' topographic maps by a digital process. With the exception of the flare and baghouse exhaust, emission sources associated with the proposed project were represented as ground-based area or volume sources. For these non-buoyant plumes, the maximum off-site concentrations in each direction will occur at the nearest downwind receptor, usually along the property boundary. The ISCST modeling was run for the same meteorological years as used in the criteria pollutant dispersion analysis presented above (1993, 1994, and 1995). The maximum one-hour and annual concentrations from the highest modeled three-year period were used in this HRA.

Risk Quantification Methods

Cancer risk, and acute and chronic health impacts were determined consistent with guidance provided in the SDAPCD document *Guidelines for Preparing Health Risk Assessments in Accordance with the Requirements of Assembly Bill 2588.* Subsequent to the completion of dispersion modeling exercise, risk levels, and acute and chronic health indices were determined at each of the 2,631 receptors in the defined receptor grid for each of the analysis years. However, only results compiled with the 1995 meteorological data set are presented, as this year was determined to present the most conservative year of analysis. A comparison of the predicted risks with the three principal health risk criteria examined in the HRA study is provided in Table 4.7-19. As shown, the predicted health impacts are below applicable regulatory human health risk threshold levels. Therefore, the proposed project would not have any potential significant impacts on human health.

**TABLE 4.7-19**
**PREDICTED HEALTH RISKS DUE TO TOXIC AIR CONTAMINANT EMISSIONS**
**FROM THE GREGORY CANYON LANDFILL PROJECT**

| HEALTH RISK CRITERION | SIGNIFICANCE THRESHOLD[a] | YEAR 19 MAXIMUM PREDICTED VALUE | YEAR 30 MAXIMUM PREDICTED VALUE |
|---|---|---|---|
| Incremental Cancer Risk | $10 \times 10^{-6}$ | $7.9 \times 10^{-6}$ | $5.5 \times 10^{-6}$ |
| Acute Non-Cancer Hazard Index for a Toxic Endpoint | 1.0 | 0.06 | 0.02 |
| Chronic Non-Cancer Hazard Index for a Toxic Endpoint | 1.0 | 0.03 | 0.04 |

*[a] SDAPCD Rule 1200.*

*Source: PCR Services Corporation, June 2002*

As discussed earlier in this section, health risk impacts were evaluated for the two worst-case years of the project life. These two scenarios occur during the year with maximum periodic construction (year 19) and the year with maximum landfill gas generation (year 30). Toxic emissions were estimated for these two scenarios and were based on conservative estimates of construction and operational activity in which all mobile source equipment were assumed to operate the entire day of operation or construction throughout the entire year. This assumption is extremely conservative, and, therefore, fugitive dust and diesel exhaust emissions were conservatively overestimated.

It is important to note that cancer risk is based on an adult being exposed for 24 hours per day, each and every day, over a 70-year period. The risk associated with project-related activity for each of the worst-case scenarios (years 19 and 30 of operation) was analyzed as if each scenario could occur over the entire 70-year exposure duration. This is not the case, since the landfill is expected to have a 30-year life, and periodic construction would only occur approximately every two to three years over the course of the first 20 years of the life of the landfill. This conservative assumption overestimates the cancer risk by 57 percent. In addition, it is not likely that any of the land uses within the surrounding area would have people exposed 24 hours per day, since people do not spend 24 hours per day every day at home or at work for a 70-year duration.

## 4.7.3.6 Site Closure

Air Quality

At the time of site closure all routine landfill operations and periodic construction activities would cease. Therefore, the generation of air emissions, including $PM_{10}$ and $NO_X$, associated with the operation and periodic construction of the landfill would be considerably reduced. Closure will involve the installation of a synthetic final cover; however, the amount of equipment and construction required will be much less than during actual operation of the landfill, and all emissions would remain below the level of significance.

The buried waste will continue to generate methane, carbon dioxide, and other trace gases, following closure. The landfill gas control system would continue to operate, and emissions from this control system would continue to decrease year after year as the production of landfill gas diminishes.

Odors have been mitigated during project operation by the use of daily cover and the gas collection flaring system. After operation, when the landfill will be closed with a synthetic final cover, the potential for odor generation will be substantially reduced since one of the principal sources of odor, dumping of landfill waste at the working face, will cease. With the gas collection system operational after site closure, odor impacts would be insignificant.

Health Effects

Landfill gas generation would continue to occur after site closure and the flare station will therefore need to remain operational after closure. As provided in the Appendix, a 70-year analysis of methane gas generation was conducted to determine gas generation over this period. As is shown in the Appendix K to this Final EIR, the project's landfill gas generation would increase each year until year 30, and would decline steadily thereafter.

The HRA conducted for year 30 (the worst-case year) showed no significant health risks from the landfill gas sources. Therefore, based on decreasing landfill gas generation rates, no significant health impacts would occur during or after closure of the landfill.

### 4.7.3.7 Relocation of the First San Diego Aqueduct Project Option

The relocation of the First San Diego aqueduct would result in a substantial increase in both dust and emissions from construction equipment. The project with the aqueduct in its current location results in construction and operational air emissions of $PM_{10}$, CO, and $NO_X$ that exceed the SDAPCD significance thresholds, and the relocation of the SDCWA aqueduct would increase the short term emissions of these pollutants. Mitigation measures applicable to construction impacts at the landfill project would also be applicable for the construction of the relocated aqueduct. After completion of the relocation of the First San Diego aqueduct, air emissions would revert back to insignificant emissions associated with on-going maintenance of the aqueduct.

## 4.7.4 Mitigation Measures and Project Design Features

Proposition C

Section 5F of Proposition C contains a mitigation measure pertaining to potential impacts from landfill gas. Proposition C states as follows:

**MM 4.7.C5F** *The Project shall include a network of vertical extraction wells, lateral transmission pipes to a gas recovery facility, and perimeter gas monitoring probes. With this system, the landfill gas would be extracted from the landfill and combusted in an enclosed flare.*

Section 5J of Proposition C contains a mitigation measure for potential air quality impacts. Proposition C states as follows:

**MM 4.7.C5J** *Air quality impacts associated with the Project shall be mitigated by meeting all requirements imposed by the San Diego Air Pollution Control*

*District for the Authority to Construct and Authority to Operate permits.*

Section 5L of Proposition C contains a mitigation measure pertaining to potential odor impacts.

Proposition C states as follows:

**MM 4.7.C5L** *To control odors on-site, the Applicant shall submit an Odor Control Plan to the San Diego County Air Pollution Control District for review and approval.*

Section 5M of Proposition C contains a mitigation measure pertaining to potential dust impacts.

Proposition C states as follows:

**MM 4.7.C5M** *To control dust from Project operations, the Applicant shall submit a Dust Control Plan to the San Diego County Air Pollution Control District for review and approval.*

Project Design Features

In addition to the dust control measures described in Section 3.5.8, the following air quality protection features have been incorporated into the project design to reduce dust ($PM_{10}$) emissions associated with construction and operation of the landfill:

- As needed, the landfill operator will wash off the tires of trucks and construction equipment after traveling on on-site unpaved roads.
- All unpaved haul roads shall be watered every two hours, unless the road surface appears visibly damp.
- The landfill operator will regularly sweep the paved portion of the site access road and water the paved portion of this road at least twice daily.
- The access road to the unloading area will be paved until the last 500 feet of the road, which will be unpaved.
- The unloading area will always be located adjacent to the active face or area where waste is being actively covered.
- Crushed rock will be used on the unpaved haul roads, which results in a two percent silt content on the unpaved roads.
- All on-site haul roads will be watered every two hours, unless the road surface appears to be visibly damp. This results in a 95 percent control efficiency for the haul roads (SDAPCD, 1996.
- Traffic speeds of no more than ten mph will be maintained on all on-site unpaved road surfaces, to prevent excessive $PM_{10}$ emissions.
- Alternative daily cover (ADC), such as synthetic tarps and processed green material (PGM) may be used at the project site, as feasible.

The following air quality protection features have been incorporated into the project design to control odors associated with the landfill:

- The landfill operator will apply cover soil to the working face of the landfill on a daily basis.
- The project design includes the installation of a gas recovery and flaring system, and incorporate BACT for $NO_X$ control.

The following air quality protection features have been incorporated into the project design to control diesel particulate emissions from on-site equipment.

- The landfill operator will utilize on-site diesel equipment that meets California certified (post-1996) off-road engine requirements; and
- The landfill operator will utilize Best Available Control Technology to reduce diesel particulate emissions from on-site diesel equipment.

<u>Impacts and Mitigation Measures</u>

In addition to the Proposition C air quality mitigation measures, and based on the environmental analysis, the following additional Mitigation Measures are proposed:

***Impact 4.7-1:*** *Project construction would result in emissions of $PM_{10,}$ and $NO_x$ that exceed the APCD significance thresholds.*

**MM 4.7-1:** The construction contractor shall implement the following dust control measures:

- The construction contractor shall use water trucks to keep all areas of vehicle movement sufficiently damp to prevent the raising of dust by travel in these areas.
- All unpaved haul roads shall be watered every two hours, unless the road surface appears visibly damp.
- The construction contractor shall wet down the site in the late morning and after work is completed for the day.
- At least once per day, the construction contractor shall wet down non-active construction areas that have not been reseeded to minimize windblown dust.
- As soon as feasible, the construction contractor shall re-establish groundcover on areas disturbed by construction—through seeding and watering those areas that will not be disturbed for extended periods (e.g., two months or more).
- The construction contractor shall reduce traffic speeds on all unpaved road surfaces to no more than ten miles per hour.

In addition, to reduce vehicle exhaust emissions:

- The construction contractor shall maintain construction equipment engines by keeping them tuned in accordance with manufacturers specifications.
- The construction contractor will only utilize California diesel fuel in heavy duty vehicles.
- The construction contractor will only employ construction equipment that meets California Exhaust Emission Standards for Post-1996 Off-Road Compression-Ignition Engines.

***Impact 4.7-2:*** *Operation of the proposed landfill would result in emissions of $PM_{10,}$ and $NO_x$ that exceed the SDAPCD significance thresholds.*

**MM 4-7.2:** The landfill operator shall implement the following dust control measures:

- The landfill operator shall use water trucks to keep all areas of vehicle movement sufficiently damp to prevent the raising of dust by travel in these areas.
- The landfill operator shall wet down the site in the late morning and after work is completed for the day.
- At least once per day, the landfill operator shall wet down non-active

construction areas that have not been reseeded to minimize windblown dust.

- The landfill operator shall reduce traffic speeds on all onsite, unpaved road surfaces to no more than ten miles per hour.

In addition, to reduce vehicle exhaust emissions:

- The landfill operator shall maintain trucks and construction equipment engines by keeping them tuned in accordance with manufacturers specifications.
- The landfill operation shall only utilize California diesel fuel in heavy-duty vehicles.
- The landfill operator shall only employ construction equipment that meet California Exhaust Emission Standards for Post-1996 Off-Road Compression-Ignition Engines.

<u>First San Diego Aqueduct Relocation Option</u>

If the First San Diego Aqueduct is relocated during the life of the landfill, the following mitigation measures should be incorporated:

***Impact 4.7-3:*** *The relocation of the SDCWA aqueduct would contribute to the construction emissions of $PM_{10}$ and $NO_x$ that exceed the SDAPCD significance thresholds.*

**MM 4.7-3:** The construction contractor responsible for the relocation of the SDCWA aqueduct shall implement the following measures:

- Use water trucks to keep all areas of vehicle movement sufficiently damp to prevent the raising of dust by travel.
- Wet down the site in the late morning and after work is complete for the day.
- At least once per day wet down non-active construction areas that have not been reseeded to minimize windblown dust.
- As soon as feasible, re-establish groundcover on areas disturbed by construction through seeding and watering those areas that will not be disturbed for extended periods (e.g., two months or more).
- Reduce traffic speeds on all unpaved road surfaces to no more than ten miles per hour.
- Maintain construction equipment engines by keeping them tuned in accordance with manufacturers specifications.

## 4-7.5 LEVEL OF SIGNIFICANCE AFTER MITIGATION

With the project design features and the mitigation measures the project would still exceed the thresholds for $PM_{10}$ and $NO_X$. No other feasible mitigation measures are available to reduce these impacts to a level of insignificance. Therefore, the project would have an unavoidable significant impact on air quality during both landfill initial construction and landfill operation.